American Standards Association
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Marginal Notes

A Question of Procedure—

Referring to "The Strange Case of the Seven-Sided Post Hole" (page 183), Dr Jules Labarthe, Jr, Senior Fellow, Mellon Institute of Industrial Research, comments:

"I noted the absence of several important groups at the time the six-sided post hole was selected as the standard. Wild life conservation service and the various fish and game commissions should have been represented because the various mammals under their care most commonly dig round holes, some of which have been utilized as post holes if they happen to occur in the right location. I noted, too, that the drillers of holes have no representation. Very probably these absences can be accounted for by the fact that post holes that are drilled or dug in situ are the disposable type and are generally used but once and cannot very well be pulled out and reused. In times of material shortage, the reuse of second-hand materials can often afford significant saving in production, but it would be a probable waste of money for any government organization, such as the Department of Agriculture, for example, to endeavor to develop a new strain of rabbits, gophers, ground hogs, or other mammals that would dig hexagonal instead of round holes.

"I do hope that your booklet has very wide circulation for it presents most graphically the story of standardization. It is a fine job, and whoever worked it out deserves a great deal of praise by all of us interested in the American Standards Association and its work."

What About Waste of Materials?

There seems to be some difference of opinion on the amount of waste in the country today (*Modern Industry* says "The prodigious waste of time, money, and materials in this country is at all times downright scandalous"; *Fortune* says "it would appear doubtful that there is an 'American standard of waste' in in-

dustry").

Both of these leading business magazines are agreed, however, that conservation pays off for business as well as for the country as a whole. *Fortune* sums up: "In field after field, conservation can mean the difference between output levels that are adequate and those that are badly crippled. Hence U. S. businessmen should cleave to the conservation movement with unswerving devotion in the troubled present."

Modern Industry is putting its belief in conservation into action.

The second executive forum on materials conservation is scheduled for Philadelphia, May 31. (For a report of the first such forum, see page 182.) As STANDARDIZATION goes to press, Brigadier General Donald Armstrong, U. S. Army (retired), now president of the U. S. Pipe & Foundry Company, is scheduled to speak. Mr Coonley will again present the story of the conservation program.

Our Front Cover

Eastman Kodak Company's Research Laboratories use an automatic spectrophotometer to record spectral transmittance curves for dye solutions. E. Richardson, shown here at work in the Laboratories, reports that since 1921 he has been applying the basic provisions now codified in the American Standard Method of Spectrophotometric Measurement of Color, Z58.7.1-1951.

These principles are widely used in other fields, as well. Color cards issued by the Textile Color Card Association, checked and correlated by the National Bureau of Standards according to these principles, are generally used in the textile industry and by the Federal Government.

For a discussion of the reasons why the three new standards, on spectrophotometric measurement, method for determination of color specifications, and alternative methods for expressing color specifications, have now been issued, see "A Guide for Measurement of Color" by David L. MacAdam, page 176.—*Photo courtesy Eastman Kodak Company.*

Opinions expressed by authors in STANDARDIZATION *are not necessarily those of the American Standards Association.*

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Standardization is dynamic, not static. It means not to stand still, but to move forward together.

In This Issue

Featured—

News—

ASA Standards Activities—

ASA

Reg. U. S. Pat. Off.

Ruth E. Mason, Editor Margaret Chamorel, Production Editor

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Standard Oil Co. (N. J.)

This multipipe system was especially designed for loading petroleum at the barge dock of the Bayway Refinery, Linden, N. J. Pipeline design problems arise in various industries—power; gas and air; district heating. A pipeline designer finds recommendations for solving his problems in the American Standard Code for Pressure Piping, B31.1. For the service conditions under consideration, he finds a rational choice of pipe diameters and wall thicknesses, classified according to Schedule Numbers, in the American Standard, Wrought-Steel and Wrought-Iron Pipe, B36.10. How these Schedule Numbers originated and what they mean is explained in Sabin Crocker's article, which follows.

How to Use Schedule Numbers for Pipe Sizes

by Sabin Crocker

SOME 20 years ago when ASA Sectional Committee B36 undertook the standardization of a series of pipe wall thicknesses, it started with a survey of existing weights of steel and wrought-iron pipe. The commonly used wall thicknesses of that time, which were traditionally known as "standard weight," "extra strong," and "double extra strong," dated back to 1886 to the work of an ASME committee on Standard Pipe and Pipe Threads. Sectional Committee B36 found that the wall thicknesses of different pipe sizes in any one of the old series were not suited to uniformly consistent service conditions. The old "standard weight" series was further confused through the presence of two thicknesses of 8-in. pipe, three of 10-in. pipe, and two of 12-in. pipe. Likewise there had been intermediate sizes such as 4½ in., 7 in., 9 in., and 11 in. that were infrequently used and could well be eliminated.

Under old usage these deficiencies had not been too important; pressures and temperatures were relatively low so that a few series sufficed and wall thicknesses were governed more by manufacturing practice and the need for providing sufficient metal for mechanical strength or corrosion or both. With the then rapidly increasing trend to higher service pressures and temperatures, however, Sectional Committee B36 found: (1) that more series of wall thickness were required; (2) that these series should be based on some rational system related to service conditions; (3) that the new series should enable a more direct application of the various safety code formulas for relating commercial wall thickness to service conditions; and (4) that little used intermediate sizes should be eliminated so as to concentrate production and stocking on sizes commonly ordered.

Mr Crocker, mechanical engineer, Ebasco Services, Incorporated, and Vice-chairman of ASA Sectional Committee B31 on Code for Pressure Piping, here explains how the Schedule Number System developed by Committee B36 is used to determine wall thickness of pipe. Sectional Committee B36, on Standardization of Wrought Iron and Wrought Steel Pipe, considers the Schedule Number System, and the chart shown in this article, to be highly important as a means of cutting time and effort on the part of all pipe designers and users. Mr Crocker was secretary of Committee B36 during the years that it was developing this System. He explains that use of the formulas makes it possible to compute, quickly and easily, the exact wall thickness suitable for the conditions for which pipe is required as described in the ASME Boiler Code and American Standard Code for Pressure Piping.

This article was published in the May issue of Heating, Piping, and Air Conditioning, *and is being given wide distribution by the committee.*

Hence, in devising the schedule number system as the basis for a logically progressive series of pipe wall thicknesses, ASA Sectional Committee B36 originated the idea of basing the system on a dimensionless parameter or ratio equal to 1000 times the internal pressure divided by the corresponding bursting stress in the pipe wall, viz:

$$1000 \times \frac{P}{S} = 1000 \times \frac{\text{Internal pressure}}{\text{Bursting stress}} \quad (1)$$

The factor of 1000 was introduced by the committee for convenience in order to make the ratios derived from the expression come out as whole numbers. This results in having Schedule 40, Schedule 80, etc instead of Schedule 0.040 and Schedule 0.080 which are more awkward to say.

Dimensionless Ratios

Attention is called to the fact that the P/S values or $1000 \times P/S$ values are dimensionless ratios that apply to any system of measurement. This is apparent from writing the units of measurement into the equation and observing that the units cancel out as shown by the following example using pounds pressure or force and square inches for area:

$$\left(1000 \times \frac{P \text{ lb}}{\text{sq in.}}\right) \div \left(\frac{S \text{ lb}}{\text{sq in.}}\right) =$$

$$1000 \times \frac{P \text{ lb}}{\text{sq in.}} \div \frac{S \text{ lb}}{\text{sq in.}} = 1000 \frac{P}{S} \quad (2)$$

More recently, the use of the dimensionless P/S index for comparing the results obtained by applying different pipe wall thickness formulas to a given set of design conditions has found considerable application. As an example of this use of P/S ratios, attention is called to ASME Paper No. 50-A-62 by Buxton and Burrows on "Formula for Pipe Wall Thickness."

In basing its schedule number system for pipe wall thicknesses on P/S ratios, ASA Sectional Committee B36 decided early that with the variety of materials available for pipe use, the thickness schedules, to be flexible, could not be set with respect to any particular temperature, pressure, or material. With schedules based on P/S values where P represents the service pressure and S the corresponding stress at the service temperature, however, all three variables are taken into account in the single ratio.

The following basic formula used by Sectional Committee B36 for computing its pipe wall thickness schedules was derived from the modified Barlow formula then used in the ASME Boiler Code:

$$\frac{P}{S} = \frac{1.75\,(t - 0.1)}{D} \qquad (3)$$

Where P = maximum internal service pressure in pounds per square inch gage

S = allowable stress in material due to internal pressure, at the operating temperature, pounds per square inch

t = nominal wall thickness of pipe, in.

In adjusting the Barlow formula to this purpose, 2 was changed to 1.75 to look after the 12½ per cent mill tolerance in pipe manufacture, and the allowance C for corrosion, etc, was rounded out to 0.1 in. The formula was not applied to nominal sizes smaller than one inch, these thicknesses being selected according to traditional usage from commercial lists.

Using the above formula as a basis, Sectional Committee B36 endeavored to evolve its principal pipe schedules around the then commonly used "standard weight" and "extra-strong" pipe lists. In this way much of the "standard-weight" list was used for Schedule 40 and "extra-strong" for Schedule 80. Double-extra-strong pipe could not be fitted into the schedule system inasmuch as it did not follow any regular P/S pattern, but it has been retained in the B36 standard because it is still manufactured by the pipe mills and fills certain needs as illustrated later in this article.

As stated in the American Standard for Wrought-Iron and Wrought-Steel Pipe, ASA B36.10, formula (3) is not intended to be used as a basis of design. It is contemplated that the user will compute the exact value of wall thickness suitable for the conditions for which the pipe is required as described in detail in the ASME Boiler Code, the American Standard Code for Pressure Piping, or similar safety regulations. From the schedules of nominal thicknesses given in B36.10, a thickness may then be selected to fulfill the conditions for which the pipe is desired. If pipe is ordered by its nominal weight or wall thickness as is customary in trade practice, the manufacturing tolerance on wall thickness must be added to the minimum thickness computed by code formulas. The next heavier commercial thickness may then be selected from the standard thickness schedules of B36.10.

The following formula for pipe wall thickness appears in current editions of the ASME Boiler Code and the Power Section of the American Standard Code for Pressure Piping:

$$t_{min} = \frac{PD}{2S + 0.8P} + C \qquad (4)$$

Where t_{min} is the minimum pipe wall thickness in inches after allowing for manufacturing tolerance, and C is an allowance, in the case of plain end pipe, for "mechanical strength and/or corrosion" of 0.065 in. for pipe sizes above 1 in.

In order to put the code formula on a basis comparable to that of the B36 formula, it is only necessary to substitute the numerical value of C and allow for the 12½ per cent manufacturing tolerance by putting $t_{min} = 0.875\,t$, where t is the nominal thickness.

Then

$$0.875\,t = \frac{PD}{2S + 0.8P} + 0.065 \qquad (5)$$

Transposing and solving for P/S

$$\frac{P}{S} = \frac{1.75\,t - 0.130}{D - 0.7t + 0.052} \qquad (6)$$

This compares with formula (3) previously mentioned as used by Sectional Committee B36 in computing its pipe thickness schedules.

Selection of Proper Pipe Wall Thickness Assisted By Use of Chart

The accompanying chart is offered as a means of assisting designers in the selection of the proper pipe wall thickness for any given service conditions in power piping using plain end steel pipe. In some cases the 1000 P/S value determined for the given conditions can be accommodated for all sizes by a single pipe schedule of those available. As illustrated in the first example given later in this article, this fortunate situation can be identified at once from the chart as soon as the 1000 P/S value is determined.

In other attempts to select the proper pipe wall thicknesses for a given set of power plant service conditions it sometimes develops that no single schedule number will satisfy code requirements in all pipe sizes. Under these conditions it becomes necessary to pick and choose from available schedules in order to make a series of selections that will be satisfactory for each of the respective sizes to be used. While this could be done through repeated solutions of the pipe wall thickness formulas given in the ASME Power Boiler Code and in the Power Piping and District Heating Sections of the American Standard Code for Pressure Piping, the process would involve considerable time and effort with the chance of errors in the rather involved computations. It is simpler and more dependable, therefore, to read the answer from a chart such as the one accompanying this article. In this way the problem can be visualized as a whole so that inconsistencies become apparent. Furthermore, the chance of making an error is reduced in proportion to the ease of solution.

The graphs shown on the chart were plotted from equation (6) for pipe sizes larger than one inch, and using a similar formula with $C = 0.050$ for sizes one inch and smaller. As a result the graphs can be used directly for determining allowable P/S ratios for plain-end pipe of the thickness schedules shown without having to make further adjustments for manufacturing tolerance and C allowance. In other words, manufacturing tolerances and C allowances are already provided for in computing and plotting the graphs.

Examples of Using the Chart

The following examples are given for the purpose of explaining how to use the graph.

Example 1—Simple Case Where One Schedule Suffices

Problem: What pipe schedule should be used for a steam system

(*Continued on page* 194)

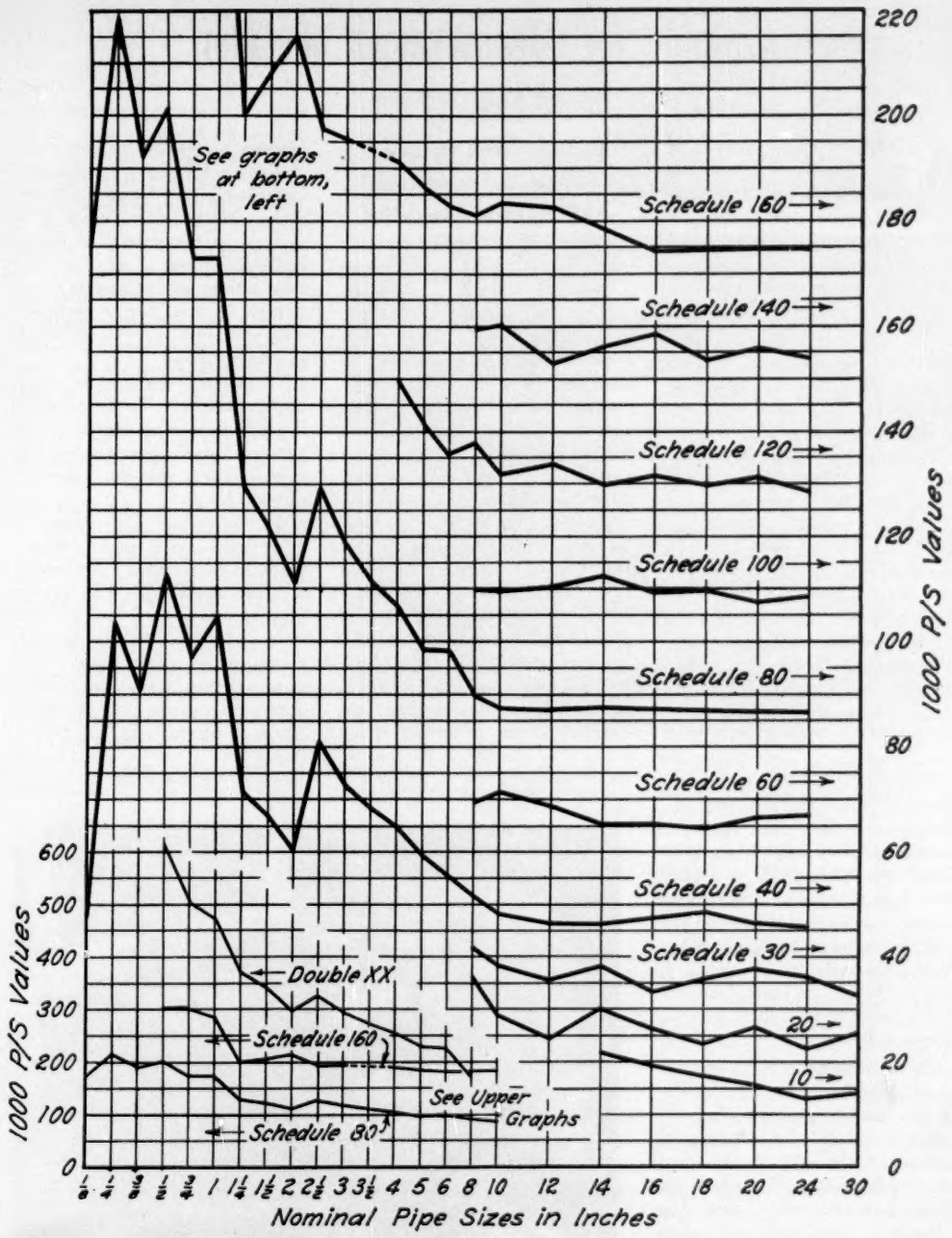


Chart Showing 1000 P/S Values vs Nominal Pipe Sizes for Plain-End Steel Pipe. Computed from pipe wall thicknesses formula in the ASME Power Boiler Code and the Power Piping and District Heating Piping Sections of the American Standard Code for Pressure Piping. As explained in the text, the plotted values include the code allowances for "mechanical strength and/or corrosion," and a 12½ percent mill tolerance in pipe manufacture.

A Guide for Measurement of Color

by David L. MacAdam

Eastman Kodak Company
Chairman, Subcommittee 7
ASA Sectional Committee
Z58 on Optics

ALL our knowledge comes to us through our senses. Even measurements and specifications must "make sense," else they tell us very little. Yardsticks, thermometers, weights, and clocks are only indirect means of recording facts that are revealed to us directly by our senses.

Primary in importance though they are, senses are too inaccurate, too unstable, and too uncertain in memory for the needs of these times. A foot cannot be estimated consistently to better than about one quarter of an inch. Fever temperature, to which we are most sensitive, cannot be judged with certainty much closer than one degree. Judgment of a pound cannot be relied upon to much better than an ounce, and it is almost impossible to signal a minute's duration with an error of less than two seconds. After concentrating on tiny things, such as watchparts, our estimate of a foot is likely to be short as much as an inch. After soaking our hands in hot water, we are likely to "feel" that a fevered person's brow is cool. After moving a number of heavy boxes, a pound of sugar seems short-weight, and forty seconds is likely to seem like a long minute. Coming out of a motion picture theatre, we are likely to find daylight unbearably bright, and it is not wise to trust the unaided memory of the colors of furnishings when selecting draperies.

On the other hand, the senses yield great precision when two similar things are directly compared, or when the position of a pointer is to be read on a scale. To be sure of the length of an object within 1/100 of an inch or better, we need only place it in coincidence with a good ruler—and look. To be sure of a temperature within 1/10 of a degree or better, we need only place a thermometer in the object, wait for equilibrium, and look at the position of the top of a mercury column on a scale. To be sure of a weight within a small fraction of an ounce, we need only place the object on one side of a balance and place known weights on the opposite side until the position of a pointer indicates equality or a small calibrated deviation from it. To be sure of a duration within a few tenths of a second, we need only press the controls of a stop watch at the beginning and end of an event and see the position of the pointer on the dial. The accuracy of any of these schemes may be greatly increased by use of mechanical, electrical, and optical refinements. But in all cases, the final step involves one or another of our senses. For example, in the most accurate measurements of length it is necessary to note the position of an interference fringe, or to read a photoelectric counter. We must note the position of the optical image of a hair-line on the scale of a microanalytical balance or of an oscilloscope pattern in some modern measurements of time. Use of the senses is the only permanent requirement of all measurements.

As measurements become more precise, standards become essential. The definition of measurements in terms of basic principles becomes more important when the highest accuracy is sought.

All the reasons for relying on measurements—of length, weight, temperature, and time—in preference to sense, apply with even greater force to color. We cannot estimate color in the sense that we can estimate length, weight, temperature, or time because there is no generally understood manner of expression like foot, degree, pound, or minute. Nor is such a manner of expression likely to become common, because

General Electric Co.

Automatic spectrophotometer identifies and checks colors at Mohawk Carpet Mills.

color involves three independent variables which are blended in a manner too subtle for commonplace distinction. Furthermore, the color sense is perhaps more subject to variation, with conditions of observation and previous experience, than any other sense. Finally, the absence of any generally understood manner of describing color handicaps our memory for colors, or perhaps difficult memory is partly responsible for poor communication.

On the other hand, our capacity for noticing small differences of adjacent colors is phenomenal and taxes to the utmost the accuracy of the best methods of measuring color. Like all measurements, color measurements must "make sense"; that is, they must detect the smallest color differences that can be seen, and should do better than that if they are to be useful for anything other than communication and record.

Although a sufficiently accurate technique for measuring color has been developed only recently, the use of so-called "color standards" has been common for over thirty years. These consist of materials which are visually compared with the sample. This may be simple side-by-side comparison or may be facilitated by optical devices for juxtaposing the colors of the standard and sample. To cover the wide range of colors (several million different colors being distinguishable), sets consisting of fairly large numbers of "color standards" have been used. To bring order out of the chaos of several hundred such standards and to insure against serious gaps, they have been arranged in a systematic manner by their originators.

Although all such systems of arrangement agree in using three independent variables, the choice of specific variables is subject to wide differences, and the several popular "color systems" differ primarily in this choice. The names of Munsell, Ostwald, and Lovibond refer to different systems of arranging "color standards."

These standards have not been adopted by any authoritative bodies having broad bases of representation, nor are they the subject of the project carried on under the procedure of the American Standards Association which is under discussion here.

Devoe and Raynolds

Material samples used in checking the color of a product may themselves have to be checked for accuracy. If you want a permanent, reproducible record of any color, the three new American Standards for measuring and specifying color tell you how to go about it. Above, these standard samples and instruments are used by Devoe & Raynolds Company in determining color of liquids for producing paints and enamels. (Below) paints are mixed in these huge vats.

Hundreds of other "color standards" are in use in commerce and industry. Usually each represents a desired color with which product samples are compared. Sometimes "tolerance colors" are used to bracket the desired color. Thus, a certain yellow carton color is specified between four tolerance limits, indicating how red or how green the yellow may be, and how light and how dark. These tolerance samples, and "color standards," in general, should perhaps be regarded as gages rather than as standards. There is little to be gained by standardizing gages, each of which is of use only in specific applications, often confined to a single product of a single manufacturer, and subject to frequent change with fashions.

It is much more important to standardize methods for measuring the colors of such gages. Material samples, especially when handled frequently in making comparisons with products, become soiled, faded, damaged, and lost. It is important to measure and record their original colors in some unambiguous, communicable way so that equivalent new inspection "standards" or "tolerances" can be selected even after the passage of years. This is the intent

of three new American Standards on methods of measuring and specifying color, just published.[1]

Suppose we have selected a set of samples of a product, illustrating the extreme limits of permissible color variations; for example, a greenish-yellow limit, a reddish-yellow limit, a dark and a light limit. Of course, we will try to make a supply of such sets sufficient for all foreseeable needs of all concerned. But to guard against loss, soiling, fading, and "doubting Thomases" ten years hence, we put each of the tolerance samples in an optical instrument called a spectrophotometer. This produces for us a permanent, quantitative record of the proportion of the light reflected by the sample for each portion of the visible spectrum. Because the measurement is complicated by irregularities of surface, by degree of glossiness, by fluorescence, and by many other details too numerous to list, our results will mean much more to us ten years from now, and to our suppliers and customers, if we use a spectrophotometer which conforms to functional requirements established by American Standard Z58.7.1-1951.

As the years go by, the dyes or pigments used in the original lots may be hard to get; or better and cheaper materials may become available. With them we may have no trouble matching the appearance of the color, but may find it impossible to make samples having spectophotometric curves like those of the original samples or of any of the tolerances. At this point we turn to well-established data concerning the behavior of human vision. Arithmetical methods are well known which enable us to decide whether samples having different spectrophotometric curves will look alike in daylight or other prescribed light. There has been a rather high degree of uniformity of American and even of international practice in this connection for the past two decades. The basic principles and data for this work are the object of the second of the new standards, American Standard Z58.7.2-1951. With them we can check samples made with new materials against the original tolerance limits, and if the mill will make enough variations, spectrophotometry supplemented with these "colorimetric" calculations enable us to select new tolerance samples made of the new materials. They are preferable to the old tolerance samples for use in day-to-day visual checking of products. Their appearance relative to goods made with the new materials is less dependent on variations of the quality of light at the inspector's station, and less dependent on the inspector having exactly normal color vision.

Experience has shown that after the spectrophotometer and colorimetry have been used for a few years in this manner to record permanently the colors of the tolerance limits, part of the task of selecting tolerance limits for new products is, quite naturally, shifted to that instrument and method. Then it becomes essential to know quantitatively what constitutes, for instance, the difference called "greener," without confusing it with either "lighter" or "stronger." For many other purposes, too, such as interpreting spectrophotometric and colorimetric results to persons relatively unfamiliar with the subject, it is desirable and even necessary to be able to translate from the working data to the traditional language of color. The third new standard group, American Standard Z58.7.3-1951, provides for uniformity of American practice in such translation.

[1] American Standard Method of Spectrophotometric Measurement of Color, Z58.7.1-1951; American Standard Method for Determination of Color Specifications, Z58.7.2-1951; American Standard Alternative Methods for Expressing Color Specifications, Z58.7.3-1951.

• • **A course in Industrial Standardization** was given in Philadelphia this Spring by Madhu S. Gokhale and Fred M. Oberlander, both of the RCA Victor Division, Radio Corporation of America. The 11-session course was sponsored by the Management Service Division of Temple University's Community College and Technical Institute, of which Harry C. Rountree is Dean.

Students in the course represented leading Philadelphia organizations, such as Minneapolis-Honeywell Regulator Company, Belfield Valve Division; Michael Flynn Manufacturing Company; Sharples Corporation; U.S. Navy; International Resistance Company; and RCA Victor Division.

In addition to Mr Gokhale and Mr Oberlander, three guest speakers addressed the class: Colonel Thew Ice, Armed Services Electronic Standards Agency, on electrical and electronic components; I. W. Markowitch, In Charge of Plating, U.S. Gauge Company, on surface coatings; and S. H. Watson, Manager, Standardizing, RCA, on administrative aspects.

Subjects covered were:

Introduction—Definition, aims and scope; types of standards; history of standardization; determination of the proper time for standardization.

Development of Standardization—Activities of Government agencies, American Standards Association, Technical Societies and Trade Associations. Method of developing new company standards.

Standardization of Basic Materials—Advantages of a purchasing specification system; types of specifications; factors in the selection of standard materials.

Standardization of Electrical Components—Basis for standardization; electrical type tests and their significance.

Standardization of Mechanical Parts—Simplification and classification of frequently used items; advantages of using standardized parts.

Standardization of Protective and Decorative Chemical Treatments and Surface Coatings—Tests for durability, uniformity and protection; economic and esthetic considerations affecting choice of finishes.

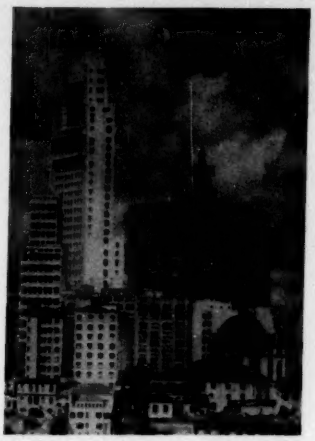
Drafting Standards—Selection of format and size; function of a drawing; sequential vs. significant numbering systems; types of drawings; dimensional tolerances.

Application of Standards—Preferred numbers, sizes and gauges; publication and distribution of standards; compliance with standards and responsibility for deviations; coding practices; consultation service; educational programs.

General Problems Connected with a Standards Program—Periodic revision; transition from one standard to another; consolidation of standards; obsolescence; coordination by means of company standards committee.

Administrative Aspects of Standardization—Need for a standardization program; place in the company organization; types of personnel and facilities required; relations with other departments; organizations and Government Agencies.

Brazil Standardizes



M. E. SOUZA, chairman of the National Standards Committee of the American Chamber of Commerce for Brazil, pointed out in his annual report for 1950 that standards committees are at work in some 35 cities of Brazil. Mr Souza is representative of the General Electric Company in Rio de Janeiro.

Brazil is rapidly developing an impressive record of standardization achievements through the Associação Brasileira de Normas Técnicas, its national standardizing body, he said. This record reflects the increasing efforts of members of the standards committees. Mr Souza called on members of the American Chamber to make an effort to work on standardization projects in order that a consensus of those having an interest in the provisions of the project can be reached.

"At the risk of repeating what has been said in the past about the importance of standards," Mr Souza told the Chamber of Commerce members, "I should like again to emphasize the point that: 'STANDARDS ARE YOUR BUSINESS.'"

An abbreviated version of Mr Souza's report follows:

Report to American Chamber of Commerce, Brazil

With world conditions as they are today, the efforts of democratic organizations will be challenged as never before to cope with material shortages, rising costs, priorities, and many changes that will be necessary as a result of the impending mobilization in the struggle for peace.

How can materials be used more efficiently? How can industry and commerce continue to develop economically and profitably? How can problems of shortages of materials best be faced? How can buyers use their purchasing funds most intelligently? The answers to these and many other similar questions are in a large measure to be found in the orderly and cooperative development of standards and their widespread use.

Yet only a start has been made. The ever-increasing number of individuals actively participating in the work of developing standards and methods of procedure is the source of considerable encouragement to those who already have been at work for some ten or more years on this cooperative endeavor. May I appeal to every member of the Chamber to make some effort to work on standardization projects continually coming up for consideration? It is only through proper representation on the working committees that consensus of those having an interest in the provisions of the project under study can be reached and revisions effected when necessary to bring them up-to-date.

There are upwards of some 35 committees at work in Rio, São Paulo, Pôrto Alegre, Belo Horizonte, Salvador, and Recife. Some of them are working on entirely new projects while others are working on revisions of, or extensions to, existing standards.

One of the most active committees formed during the past year is one dealing with electronic equipment.

Another on electrical engineering and illumination—the Comite Brasileiro de Electrotécnica e Iluminacão—has just been organized.

In times such as we are facing in Brazil today, all these activities should become even more important; first, because it is necessary to save critical materials; second, because greater production is possible with standardized products and methods. The consumer also benefits through lower costs, and, conceivably, through a wider source of supply in the case of a product made to a given and properly promulgated standard.

It is worthy of special mention that the American Standards Association continued during the year under review its liberal policy of supplying to ABNT and others, on a courtesy basis, an appreciable quantity of its standards in printed pamphlet form. This service, needless to say, has proven very valuable and is much ap-

(*Continued on page* 199)

Brazilian Govt Trade Bur

Manufacturing rubber gloves is an important industry in Brazil. (Above) The modern city of São Paulo is a center for standards work.

Diesel Engine Industry Aims for Growth

AHEAD-ON attack on one of the problems plaguing industry today—education of engineers—is one of the principal 1951 undertakings of the Diesel Engine Manufacturers Association. The Association recently recognized national standards as tools in its industry program by affiliating with the American Standards Association as a Member-Body.

The Association is tackling the educational problem with the special needs of its industry in mind. The industry is hiring an ever-increasing number of engineers, most of them mechanical engineers. Many companies have training programs of their own for young engineers, to teach them the special techniques of their particular company. However, the industry wants engineer graduates who are well-trained in fundamentals. By keeping closely in touch with teachers of Diesel engineering, the industry is not only keeping the most up-to-date developments, problems, standards, and methods before the engineering teaching staffs and students, but also is stimulating research projects to develop additional knowledge.

This is done through conferences at university centers in all parts of the country and through "summer schools" at plants where Diesel engines and engine parts and accessories are manufactured.

The conferences give engineering teachers in colleges and universities an opportunity to meet with representatives of the Diesel Engine Manufacturers Association and manufacturing companies. Thus, teachers not only meet industry representatives personally but have an opportunity to discuss with them the latest information on the subjects in which they are especially interested. Questions frequently arise also as to the type of education needed by engineering students. Discussions may include, for example, questions such as: What type of laboratory experiments are the best training for an engineer? What technical courses should be included in a mechanical engineering curriculum?

Otto H. Fischer
President, Union Diesel Engine Co. (DEMA President)

Harvey T. Hill
Executive Director, Diesel Engine Manufacturers Association

The Association believes this program helps to stimulate research needed by the industry. It gives industry representatives a better knowledge of the research talents available in the colleges and gives the professors a clearer understanding of industry problems that need solution.

Among conferences scheduled this year are one in Cleveland at the Aluminum Company of America plant; one in Buffalo at Worthington Pump and Machinery Corporation; at the University of Denver; at the Winslow Engineering Company in Oakland, California; at the Wilkening Manufacturing Company in Philadelphia; at the Farr Company in Los Angeles; and at the Cuno Engineering Corporation, Meriden, Connecticut.

Out of a total of approximately 800 professors teaching courses in Diesel engineering, approximately 500 have attended one or more of the educational conferences already held, the Association reports.

In addition to the conferences and "summer schools," the Association has been instrumental in getting a number of universities to put on "Power Plant Operators' Conferences" at their schools. Men who operate Diesel power plants come to these conferences to learn more about how to handle their jobs.

This educational program is only part of the work the Association is doing to carry out its purpose of improving the standard and quality of the product manufactured and sold by its members and to extend the use of Diesel engines.

Two meetings of Chief Engineers of member companies have been scheduled during 1951. Technical subjects and problems will be discussed.

Organizations using Diesel engines will have a wider knowledge of technical developments in the industry as a result of the Association's cooperation with the American Society of Mechanical Engineers and the Society of Automotive Engineers. The Association will have a part in the annual meeting of ASME's Oil and Gas Power Division in June, and in the SAE meeting in October.

The Association is at present work-

ing with the National Production Authority and other Governmental agencies connected with the defense mobilization program. The NPA has formed a Diesel Engine Advisory Committee, made up of a number of representatives of the Association's member companies. This committee* meets with representatives of the defense services. They tell the Government their production needs and learn from the Government what the defense program needs from the Diesel industry.

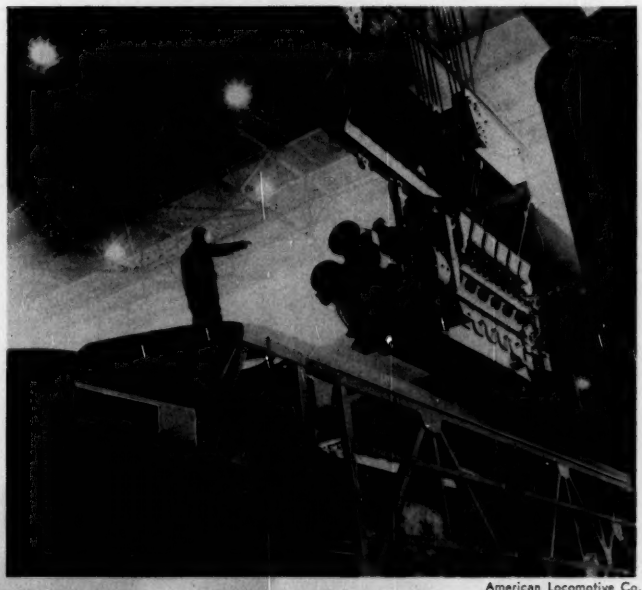
Progressive developments in the industry during the past few years are reflected in a revision just being completed of the "Standard Practice for Low and Medium Speed Stationary Diesel Engines." These standards, developed as an industrywide effort by member companies of the Association, were first published in 1935 and revised in 1946. T. M. Robie, Director of Quality Control, Fairbanks, Morse & Company, was chairman of the committee that prepared the new edition, to be off the press by July 1. The book is intended primarily for consulting engineers, buyers, users, and manufacturers of Diesel engines and engine parts and accessories, but is expected to serve also as a reference work for colleges and universities teaching courses in mechanical engineering. In addition to information on such subjects as Diesel engine construction, governors and speed regulation, torsional vibrations and critical speeds, and selection of engine sizes, it includes data on fuel oil and lubricating oil characteristics, operation and maintenance, and a field test code.

The Diesel Engine Manufacturers Association also publishes a standard guide for naval architects, shipbuilders, and ship operators. This "Marine Diesel Standard Practices" gives information about construction, installation, testing, performance, operation, and maintenance of Diesel engines for shipboard use. The most recent edition was published in 1948. Edmund Frederick, assistant chief engineer of the Cooper-Bessemer Corporation, was chairman of the industrywide committee that prepared the 1948 edition.

DEMA is operated under the supervision of a Board of Directors, which includes executives of many of the outstanding manufacturing companies in the country. Members are: William E. Butts, President, Enterprise Division, General Metals Corp; General Levin H. Campbell, Jr, Executive Vice-President, International Harvester Co; C. Paul Clark, President, Clark Bros Co, Inc; George W. Codrington, Vice-President, General Motors Corp; M. C. Davison, Vice-President, Ingersoll-Rand Co; Robert E. Friend, President, Nordberg Manufacturing Co; Gordon Lefebvre, President, The Cooper-Bessemer Corp; William S. Morris, Vice-President, American Locomotive Co; and E. J. Schwanhausser, Executive Vice-President, Worthington Pump and Machinery Corp; Robert H. Morse, Jr, president, Fairbanks Morse & Co.

President of DEMA is Otto H. Fischer, President of the Union Diesel Engine Company, Oakland, California. The two vice-presidents are A. W. McKinney, Executive Vice-President, the National Supply Company, Toledo, Ohio, and Marvin W. Smith, President, Baldwin-Lima-Hamilton Corporation.

* Committee members recently complained of rigid specifications required for military products, the National Production Authority has reported in a news release about a meeting of Diesel manufacturers recently. Members said some specifications are outmoded and demand extensive testing, resulting in wasted man hours and excessive use of critical materials.



American Locomotive Co.

Diesel engine being lowered into place in railroad locomotive. 20 years ago railroads used practically no Diesel engines; today most railroad engines ordered for domestic use are Diesels.

• • **Gay on Hardware Corporation Board**—Roger E. Gay, president of the Bristol Brass Corporation, and chairman of American Standards Association's Executive Committee, has just been elected a director of the American Hardware Corporation. Mr Gay is now serving on the Copper and Brass Advisory Committee for the National Production Authority and is on the executive committee of the Copper and Brass Research Association. He is also chairman of the Industrial Problems Committee of the National Association of Manufacturers as well as a director of a number of corporations.

Industry Meets on Conservation

EXPECTING a strong revival of government-sponsored measures to conserve materials, *Modern Industry* magazine on April 24 instituted a series of meetings with local manufacturers' associations. The purpose is to find out what needs to be done and to encourage industry to take the initative rather than, as Howard Coonley puts it, "waiting to be spanked by shortages."

The first meeting was at York, Pennsylvania. Co-sponsored by *Modern Industry* and the York Manufacturers' Association, it brought together Federal officials and 25 executives of York manufacturing firms.

Howard Coonley, chairman, Conservation Coordinating Committee, Defense Production Administration, was principal speaker and moderator. He was joined by Franklin P. Huddle, conservation specialist, Munitions Board. They presented the Government's materials-conservation plans.

Following luncheon, two companies from outside the York area described their conservation programs. James Toney, publicity director for Radio Corporation of America, Camden, N. J., and John H. Dingee, advertising manager for Henry Disston & Sons, Inc, Philadelphia, were the speakers.

Modern Industry reports:— "Despite the prediction of Charles E. Wilson in his latest report to the President that defense will absorb not more than 20 percent of our national output by 1953 (providing there is no World War III), Coonley promises that far more stringent government-sponsored moves to undertake and inspire widespread materials conservation soon will be forthcoming. This drive—embracing all industry—will focus on three major means of saving: (1) Standardization and Simplification; (2) Substitutes and Alternates; and (3) Salvage, Reclamation, and Savings at the source."

The Conservation Coordinating Committee, started about three months ago, is made up of representatives from 17 agencies, Mr Coonley explained. They include the Army, Navy, Air Force, Munitions Board, National Production Authority, the Departments of Commerce, Agriculture, and Interior, the Atomic Energy Commission, and the Economic Cooperation Administration.

Three important functions in the field of conservation are assigned to the Committee:

(1) To coordinate activities of the 17 agencies

(2) To plan projects that might be undertaken by these agencies

(3) To provide a clearing house for conservation suggestions sent to Washington

Preliminary ideas and suggestions that came out of the York meeting include the following:

(1) Form plant committees to concentrate on materials conservation

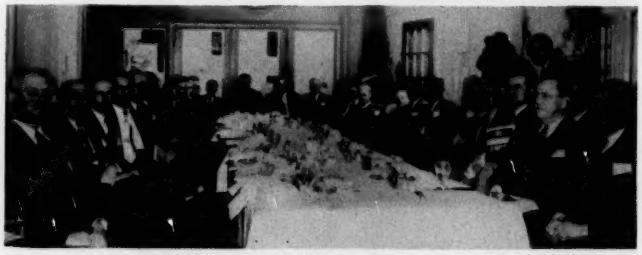
(2) Determine and announce, from Washington, the relative critical state of materials to help manufacturers plan for production and substitutes

(3) Provide manufacturers, from Washington, with information substantially more in advance of the time it's made available now on amounts of materials they may expect to get

(4) Set up a plant substitution committee with representation from engineering, manufacturing, and purchasing. One York manufacturer has already done this, it was disclosed.

"This meeting concurred in one determination: that product changes to conserve critical materials are, and will be so far as possible, made to maintain or exceed previous levels of quality," *Modern Industry* reports. "Often such shifts are regarded as permanent and, even though production costs may be temporarily higher, they foresee this problem being solved over the long pull by improved methods and equipment."

In setting up the forum, *Modern Industry* cooperated with John F. Padden, executive secretary, Manufacturers' Association of York; J. Keith Louden, vice-president, York Corporation; and William D. Kirkpatrick, vice-president, American Chain & Cable Company.

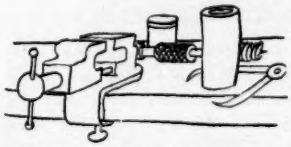


EXECUTIVE FORUM GROUP, left, clockwise: W. J. Fisher, A. B. Farquhar Co; F. P. Huddle, U. S. Munitions Board; L. W. Aigeltinger, Wrightsville Hardware Co; C. W. Ness, F. B. Messner, Read Standard Corp; J. H. Lindholm, Lyon Metal Products Co; R. F. Dauer, F. J. Allen, H. E. Aughenbaugh, York Corp; J. M. Toney, RCA; E. A. Sieften, H. M. Sossaman, Quaker Rubber Corp; J. H. Dingee, Henry Disston & Sons, Inc; C. W. Wellinger, Lebanon Steel Foundry; A. B. Wheeler, Modern Industry; J. F. Padden, York Manufacturers' Assn; J. T. Robertson, York Corrugating Co; C. M. Norris, American Insulator Corp; E. A. Gentzler, United Wallpaper, Inc; J. J. Cadot, Hardinge Mfg Co; J. Butler, G. S. Schmidt, American Chain & Cable Co; E. I. Kraber, York Electric & Machine Co; S. S. Sechrist, Red Lion Cabinet Co; E. F. Peck, Westinghouse Electric Corp; A. W. Gudal, Lukens Steel Co; A. S. Marshal, stenographer; M. G. Munce, York Corp; Howard Coonley, OPA. At back, r, H. E. Blank, Jr, Modern Industry.

the strange case of the seven-sided post hole

DIGBY HOLESTON POSTLETHWAITE is the American Standards Association's candidate for "Man of the Year." As central character in ASA's just-published booklet, *The Strange Case of the Seven-Sided Post Hole*, Digby is given credit as the moving spirit behind standardization in the "post hole" industry.

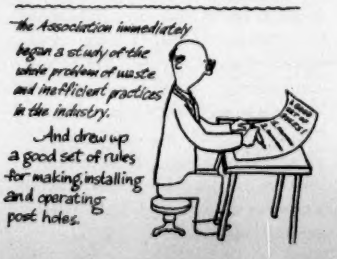
Each company made hundreds of different kinds of post holes. And each wanted its holes to be as different as possible from the holes made by all the other post hole companies.



As explained in the booklet, before standardization this variety cost time, money, and customer goodwill.

So they formed the ASSOCIATION OF POST HOLE AND HOLE POST EQUIPMENT MANUFACTURERS AND FABRICATORS, INC.

DIGBY WAS ELECTED THE FIRST PRESIDENT



The Association immediately began a study of the whole problem of waste and inefficient practices in the industry.

And drew up a good set of rules for making, installing and operating post holes.

All the members of Digby's association agreed with him when he said: "This is all right as far as it goes. But it doesn't go far enough. We are not in agreement on a lot of things with other people and organizations who are interested in post holes. We ought to do something." So they got the clearing-house of voluntary standards to call a meeting to see about a national standard.

THE TECHNICAL COMMITTEE elected its own chairman and agreed to follow the rules of the standards clearinghouse.

They said:

They argued about these and many other matters concerning post holes.

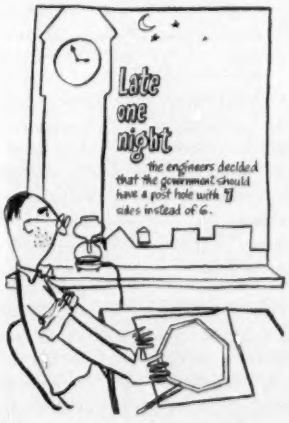
Thus, the American Standard Specifications for Lap-Welded, Butt-Welded and Seamless Post Holes came into being.

YOU COULD ORDER POST HOLES BY MAIL FROM NEW YORK, NEW YORK, AND KNOW THAT THEY WOULD FIT INTERCHANGEABLY WITH THE POSTS YOU HAD IN WALLA WALLA.

THE PRICE OF THE SMALL SIZE POST HOLE (Now known as the SMALL SIZE POST HOLE) WENT DOWN.

Now, almost anyone could buy all the post holes he needed to sustain a good standard of living.

Sales went up, and so did wages and profits . . . and costs went down.



What happened to bring the final denouement should remain for readers of the booklet to find out for themselves.

The American Standards Association recommends *The Strange Case of the Seven-Sided Post Hole* as instructive and amusing reading.

Copies of the booklet may be obtained from ASA.

More National Production Authority Activities

The National Production Authority continues to advise the use of standardization in ever widening branches of industry. Some of the latest industries to receive such suggestions for conservation measures are listed below:

Truck Trailers — Production of truck trailers, although running at a rate higher than last year, has been suffering from deficiencies of axles, wheels, fifth wheels, tires, and other components. NPA conservation representatives have suggested that the truck trailer industry conserve steel, copper, and aluminum by simplifying and standardizing.

Electrical Wiring Devices — The Industry Advisory Committee has recommended formation of two task committees, one to make a study of the industry's problems on material requirements and the essentiality of the industry's products; the other to investigate the possibilities of conserving materials by standardization and simplification of the industry's products.

Veneer Package and Plywood Box —An industry-wide conservation program to conserve critical materials, standardize products, employ substitutes, and review specifications problems was discussed at the first industry advisory committee meeting, April 23.

Pulp and Paper Machinery Manufacturers—NPA has asked for a report from each company on current scrap inventories and has emphasized that the industry can contribute greatly toward conservation of critical materials by standardizing products, reducing plate and sheet sizes, and simplifying design.

Doors and Door Frames — NPA has asked for recommendations on standardization of door and doorframe sizes as a means of saving critical metal. Members of the Hollow Metal Doors Industry Advisory Committee agreed to submit recommendations. Requirements of building codes and underwriters' specifications are to be taken into consideration in agreeing upon a reduced list of permitted sizes. Types of doors considered for standardization included swing doors, underwriter label doors and frames, industrial slide doors and residential slide closet doors.

Flexible Plastic Containers — A task group has been appointed to study problems of conservation, standardization, and substitution of critical materials. Members of the group are: Henry E. Griffith, Vice-President and General Manager, Plax Corporation; Robert L. Lee, Vice-President and Sales Manager, Shellmar Products Company; and Herbert Holbrook, Sales Manager, Standard Cap and Seal Corporation.

Aluminum Foil Packaging Converters — The Industry Advisory Committee has decided to explore possibilities for additional conservation and simplification methods in the industry.

Aluminum Cooking Utensils — NPA expects to appoint two task forces to suggest simplified designs and prepare statistical data on production, capacity, and material consumption. One will be for castware vessels and the other for sheetware utensils.

Bristles and Bristle Products — Manufacture of painters' brushes is limited to types specified in Order M-18 and permissible dimensions are established. Use of bristles longer than 2⅝ in. is limited to certain brush types listed in the schedule. Bristles not longer than 4 in. are limited to use as integral parts of industrial production operations. Manufacturer's sale or delivery of painters' brushes containing bristles longer than 2⅝ in. is limited to DO rated orders.

Molybdenum-Bearing Steels—Molybdenum content of stainless steel is limited to 2.5 percent. In effect, the alloy is eliminated entirely from production of AISI Type 317 stainless steel which requires a molybdenum content ranging from 3 percent to 4 percent. AISI Type 316 steel, which has a molybdenum content of 2 to 3 percent, is modified due to the fact that 2.5 percent is now the maximum molybdenum content. This is expected to affect such industries as chemical, textile, and oil refining. It may reduce the "life" of items used in these industries by making them more susceptible to corrosive chemical action.

Vacuum Cleaners—At a meeting organizing the Vacuum Cleaner Industry Advisory Committee, NPA named a task force to recommend possible conservation measures, to study standardization of components and simplification of sales lines, and to study the industry's repair parts problem.

• • **"Uneconomic income"** is the target for some barbed remarks by Sumner H. Slichter in *The American Economy—Its Problems and Prospects* (Alfred A. Knopf, 1948). "Does the economy permit a substantial amount of income to be acquired in uneconomic ways—that is, by misrepresenting goods, by restricting production, by shifting real costs of production to workers or to the community, or by wasting resources?" Mr Slichter asks. "No reliable estimate of the amount of income acquired in uneconomic ways is available," he concludes.

"Considerable progress has been made in recent years in reducing the opportunities to earn a living in uneconomic ways—particularly by misrepresenting goods or unfairly shifting costs," Mr Slichter declares. "Pure food and drug acts, the securities and exchange act, the introduction of standard grades, are all examples of the attack upon misrepresentation."

Decisions on Unusual Injuries

The Committee of Judges of ASA Sectional Committee Z16 on accident statistics have recently handed down the following interpretations. The American Standard Method of Compiling Industrial Injury Rates, Z16.1-1945, offers generally accepted rules for keeping track of a company's safety record.

Interpretations of the standard can be obtained by sending the facts on doubtful cases of injuries due to unusual accidents to the American Standards Association. Reprints of all the published decisions can also be obtained from ASA.

CASE 96. While performing his work, employee twisted his right knee and suffered a sprain. The knee did not respond very well to treatment, and the doctor put the leg in a partial cast. The nature of the employee's work was such that he could perform most of his normal duties even though handicapped by his injured leg. In reporting to work in this incapacitated condition, he was not presenting an additional hazard to others.

Although it was evident that the employee could continue with most of his normal duties, he could not drive his car to work. Because of the location of his home, it would have been necessary for some other person to go a considerable distance out of his way to bring the injured employee to work. In summary, the injury did not prevent the employee from performing his work duties, but it did prevent him from traveling from his home to his place of employment. Should this injury be counted as a disabling injury, and should the time lost by the employee be counted as lost time in computing severity records?

The committee believed that this case was very close to the borderline but finally came to the conclusion that it should be counted in the rates, on the basis that inability to get to the job by any reasonable means of transportation available, because of the injury, should be considered as inability to perform the job.

CASE 97. On July 4 an employee reported to the medical department that a piece of channel iron had struck the back of his head on July 2. There was a slight raised area on employee's head at the time of the report.

On August 11, employee reported to medical that he was having low back pain and wondered if it could be caused from his injury of July 2. He reported that he had had treatment by an osteopath. Employee was advised to see the company physician.

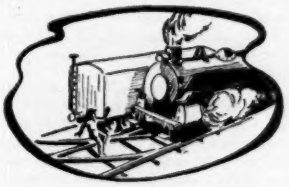
August 23, employee reported that when he got bumbed on the back of his neck and head, he also got a twist and had pain between his shoulders and in the lumbar area. He reported that he had visited doctor A for treatment on July 12, July 29, and August 22.

August 30, doctor A reported that employee apparently had an arthritis due to a strain but he was sending him to doctor B for further examination.

September 19, doctor A reported that doctor B's diagnosis of employee's disability was an arthritis that was aggravated by his injury of July 2. The employee returned to work after losing a total of 94 days.

The plant felt that the accident was so slight that it was not responsible for the employee's arthritic condition.

The committee agreed that this case should be considered an industrial injury. It particularly called attention to paragraph 3.7 of the standard, which states that in question of doubt the classification of an industrial injury shall be based upon the decision of the physician engaged by or authorized by the employer to treat the injury. Although not specifically stated, it would appear that doctor A and doctor B were authorized by the employer to treat the injury and the company did not question the doctors' opinions that the injury was at least aggravated by the accident on July 2.



CASE 98. An employee in the batch department of a glass plant was shoveling cullet (broken glass) in a cullet bin, and when he came to get out of the bin he became wedged in the opening. He suffered a strained muscle in the anterior chest wall. The plant doctor sent the employee to the hospital. He had a history of heart trouble and the doctor wanted to keep him under observation in order to rule out any possible heart complications. The sprained chest muscle in itself was not serious enough to have warranted hospitalization.

At the end of 48 hours it was determined that there was no heart complication. The employee was released and went back to work on his next regular shift.

The company did not think this should be counted as a lost-time accident because the employee did not lose time on account of the sore chest muscles from this injury but because the doctor did not want him to work immediately due to the possibility of a heart condition. As it turned out there was no heart condition resulting from the accident.

The committee agreed that this case should be included in the rates. Some of the members remarked that whereas paragraph 3.4.3 provides for a 48-hour observation period, this has been limited to the three following conditions: (*a*) a blow on the head, (*b*) a blow to the abdomen, or (*c*) the inhalation of harmful gases. They did not believe they were empowered to extend the code in order to provide this 48-hour waiting period for other types of injury.

CASE 99. The deceased was foreman of the sampling crew of the Plant Chemical Control Section in a large plant that operated its own railroad within the plant. He arrived at work at 7:30 A.M. and about two hours later told his supervisor that he had nervous indigestion and that he was going to go home. He was last seen alive walking along the railroad tracks.

The 100-ton diesel electric locomotive was unexpectedly stopped on a side track by the yard master in order to give the engineer and switchman instructions to cut out two damaged freight cars that were directly opposite on the main track. The engineer and switchman mounted the rear of the locomotive, took it out through a switch, and returned on the main line. It was at this point that they observed the deceased's body, severed, on the track they had just used.

The company provided photographs of the location and reported in detail on the last known movements of the employee. No one saw the accident and no plausible reason could be advanced as to why the employee took the route along or across the railroad tracks where he was struck.

The committee agreed that this was a reportable industrial fatality. The members remarked that this employee was still on company premises and still presumably working for the interests of his employer at the time of the injury. The members did not find any evidence either of intentional suicide or any actions that would place this employee outside of his employment at the time of the injury.

CASE 100. The employee was a cement finisher on a construction job in Alabama. On July 5 he was finishing curb and gutters from 8:00 A.M. until 11:30 A.M. and thereafter he was working on concrete slabs partly in the shade but mostly under the direct rays of the sun until 2:30 P.M. He had eaten his lunch at noon and had complained once or twice that he was hot and felt as if he were burning up. It was hot summer weather. At about 2:45 P.M. the employee became sick. He was sweating profusely. He was taken to the hospital and died at about 4:30 P.M.

The company submitted a complete record of their investigation of this case including the opinion of their doctor. Their conclusion was that this employee's death could have resulted from possible heat exhaustion.

The committee agreed that this fatality should be considered an industrial injury.

The members concluded that this employee died of heat exhaustion and, from the evidence submitted, he was probably exposed to heat and the direct rays of the sun to a greater extent because of his employment than would be normal for the general public.

CASE 101. An employee had recently been transferred to the shipping department. In spite of both verbal and written safety rules that tractors were not to be driven by anyone except the regular drivers, this employee decided to use a tractor to go on an errand. He drove over a carton of bottles on the floor. The steering gear locked. The tractor skidded, and both tractor and employee fell over the side of a bridge at a loading dock and landed on the tracks a few feet below.

The employee suffered contusions of the right leg and a cerebral concussion. The employee went to the hospital and, after spending one day there, the doctor released him to go home. Other than soreness of his leg and headaches he was back to normal health. Employee did not actually go back to work for 12 days and there was some doubt as to whether he had been out because of his injury or for personal reasons, such as the start of the hunting season.

The company reported that on the day following the injury the plant doctor had mentioned that the employee was apparently all right and had given his permission for the employee to return to work. The doctor had also stated that with a head injury of this nature it was good policy to observe the case for a short period

of time to determine the possible onset of a more serious head condition, in this case, extra dural hemorrhage. This had not developed and there was no reason for this employee not to try to return to work.

The committee agreed that this case should not be included in the injury rates, on the basis that the doctor's statement would indicate that the employee stayed away from work for personal reasons, and that his 24 hours in the hospital was for observation only.

CASE 102. A Technical Information Meeting was being held at one of the company-operated plants. The first session was scheduled to begin at 2:00 P.M. on Monday and extend through to the evening.

Three salaried plant employees requested and received permission from their supervisor to attend the sessions. They had reported to their regular work place on the first day of the session, as the first meeting was not scheduled until afternoon. At lunch time they left their regular work place, and to avoid having to return in the evening, elected to drive to the meeting place in a vehicle owned and operated by one of the group. The men were allowed to schedule their work time and place with the meeting schedule as a convenience to them. They were traveling over a graveled public road which was under construction but which was conspicuously marked with "reduced speed" and construction warning signs. While traveling in an easterly direction at about 50 mph they met an oncoming car which "kicked up" a considerable dust cloud. On entering the dust cloud the driver reduced speed to about 35 mph due to reduced visibility. They continued on for a short distance when they ran into a second, heavier dust cloud in which visibility was zero, when suddenly they ran head-on into a road sweeper. The force of the impact threw the passenger in the front seat against the windshield and he suffered a cerebral concussion and lacerations to the face and lip. Neither the driver nor the rear seat occupant was injured. The injured was hospitalized for observation of the concussion effects and for treatment of a laceration to the lip which required suturing. Four days of disability resulted.

It was requested that the case be considered by the committee to determine acceptability under the provisions of paragraph 2.1.5.1 of the code which exempts time spent by employees in traveling to a designated meeting place from the time spent in the course of employment. Attention was further directed to the fact that the employees traveled in their own vehicle to the meeting place as a personal convenience. While admittedly some benefit might have resulted to the employer from attendance at the conference, the company did not feel the incident fell within the meaning and intent of "arising out of and in the course of employment."

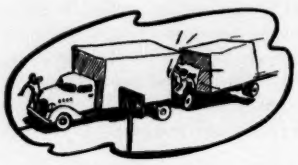
The committee agreed that this case should be included in the rates, with the time charge shown as 4 days. The members commented that it had been construed that the men were working in the interests of the employer and with his permission at the time of the accident.

CASE 103. A company asked if the following hernia case should be charged as a lost time injury:

A carpenter was engaged in moving fire doors for installation in a fire wall between the bottling house and case storage house. One man was holding each corner of the door and it was necessary to move it over a case conveyor. Two employees lifted the door from one side and the other two, including the carpenter, prepared to lower it on the other side. The carpenter was standing on a platform raised about two feet above the floor and, as he stepped from the platform to the floor, while holding the door, he felt a stinging sensation in his right groin. He continued to hold the door with one hand and rubbed the spot where the pain was located with the other hand, then continued his work without cessation and without mentioning the incident to his fellow workers. He did not think he had sustained any injury but when he awoke the following morning at his home he found a small knot in his right groin which was very tender. He reported to the plant hospital immediately and was sent to the company physician who diagnosed the condition as a right inguinal hernia and relaxed left ring. (Pre-employment physical examination indicates both right and left rings were relaxed at time of employment.)

The carpenter continued to perform regular work in his department but was restricted from lifting by his doctor. He continued to work for about five days. He then entered the hospital for surgical repair of the hernia.

The committee agreed that this hernia should be included in the rates. The members concluded from the description given that there was at least a momentary stoppage of work as a result of this injury and therefore believed that the hernia



should be counted in accordance with paragraph 2.2 of the standard.

CASE 104. A 22 year old employee was hired June 13. Physical examination at that time showed no physical defects. He worked about 5 days a week for a month. This was apparently outdoor physical labor. His last 8 days were as follows:

		Weather Report Temperatures	
		Max	*Min*
July			
6	Breaking chunks, 8 hr	87	54
7	" " 8 "	97	62
8	" " 8 "	96	69
9	Picking up rocks in piles, 8 hr on B R & G	95	68
10	Breaking chunks, 4 hr	94	68
11	Home (Saturday) Haying on own farm	102	69
12	Home (Sunday) Haying on own farm	102	71
13	Breaking chunks and laying out ties on new main line, 5 hr	102	71

7:00- 8:00 A.M., Breaking chunks
8:00- 9:30 A.M., Piling old ties
9:30-12:00 noon, Placing steel ties on main line
12:00- 1:00—lunch hour

He did not complain of his health until shortly after 12:00 noon on July 13, while sitting in the shade of an electric shovel, eating his lunch. He had consumed about two ordinary sandwiches, before he lay down to rest. It was then that he went into convulsions, and, in a short time was removed to the hospital, where he was treated for sunstroke.

He died in the hospital at 8:05 P.M. that same day. Death was attributed to heat stroke, as determined by review of clinical record and autopsy.

(*Continued on page* 194)

Standards From Other Countries

MEMBERS of the American Standards Association may borrow from the ASA Library copies of any of the following standards recently received from other countries. Orders may also be sent to the country of origin through the ASA office. The titles of the standards are given here in English, but the documents themselves are in the language of the country from which they were received.

For the convenience of our readers, the standards are listed under their general UDC classifications.

629.113 Motor Vehicles

AUSTRIA	ONORM
Shaft-ends of Auxiliary Machinery	V 5412

GERMANY	DIN
Special Lock Nut	70851
Oil Pump	71422, B1.3
Lighting Dynamo 112 mm Diameter	72413, B1.1
Lighting Dynamo, 76.2 mm Diameter	72417
Voltage Regulator for Lighting Dynamo	72420, B1.1
High Tension Ignition Cable	72561, B1.1
Fuses Box	72582

POLAND	PN
Spark Plugs and Spark Plug Seats, Dimensions	S 76035/6

629.118 Light Vehicles with not more than Two Wheels

GERMANY	DIN
Bicycle Wheel Rim	79452

SWEDEN	SIS
Bicycles, Steel Tubing for—	364
Bicycles, Nominal Dimensions of Thread for—	365
Front Hub and Cone Bearings Axle and Cone	1306/7/8
Balls and Ball Races for Cycles	1368/9
Thread Tolerance for Cycles	1380
Luggage Racks for Cycles	1388
Sprocket Wheels	1401
Ball Bearings, Axle and Hub Housing for Cycles	1436/7/8

637 Produce from Domestic Animals

BELGIUM	NBN
Fat Contents in Cream (Volumetric Method of Gerber-Koehler,	209-1950

RUMANIA	STAS
Cheese "Brynza"	962
Goat Hides, Raw	1218

643.3 Kitchen Utensils

NEW ZEALAND	NZSS
Standard specifications for household tinware utensils	602-1950

POLAND	PN
Aluminum Colanders	M 77039
Kitchen Enamelware	M 77107,-77154,-77161/2,-77176,-77182,-77199,-77205
Galvanized Buckets	M 77302,-77308/9
Small Coal Shovel, Galvanized	M 77320
Brush for Washing Kitchen Pots	A 54009
Aluminum Egg Frying Pan	M 77014
Enamelled Egg Frying Pan	M 77211
Different Types of Galvanized Pots and Kettles	M 77303/4/6/7/10
Aluminum Skimmers	M 77183
Aluminum Wares: Saucepans	M 77006
Aluminum Wares: Lids	M 77010
Aluminum Wares: Frying Pans	M 77012
Aluminum Wares: Colander	M 77015
Aluminum Wares: Ladle	M 77016
Enamel Ware: Kettle	M 77206
Enamel Wares: Skillet	M 77210

SWEDEN	SIS
Kitchen Equipment, Nomenclature	60 00 23
Kitchen Cupboards, Wooden, Different Types Including Wall Cuboards, Standing Cupboards, Sink Stands Plain and with Tables, Bench Tops, Wash and Rinsing Tubs, etc.	60 00 24 through 60 00 50

645 Furniture, Furnishings, Upholstery

POLAND	PN
Wooden Chair	F 78040

RUMANIA	STAS
Office Furniture. Telephone Table	944
Wooden Chairs	1246
School Wooden Furniture. General	1143

SWEDEN	SIS
Mattresses and Bed Frames for Adults	70 00 01

664 Preparation and Preservation of Solid Foodstuff

ISRAEL	SI
Chocolate, Plain and Mixed (Excluding Special and Filled Chocolate)	36

RUMANIA	STAS
Fruit Pastes (Purees)	966/7
Canned Meat	1089
Canned Ham	1224

SPAIN	UNE
Sugar	34200

UNION OF SOUTH AFRICA	SABS
Manufacturing of: Tomato Sauce or Ketchup Worchestershire Sauce Cucumber Pickles Mayonnaise and Salad Cream Dressing	15/2/20T

665 Oils, Fats, Waxes

BRAZIL	IPT
Fish Oil	88
Tung Oil	91

INDIA	IS
Specification for Asphaltic Bitumen and Fluxed Native Asphalt for Road-Making Purposes	73

POLAND	PN
Fuel Oil, Test for Diesel Index	C 04030
Tetraethyllead Test of Gasoline	C 04039

RUMANIA	STAS
Technical Vaseline, Natural	916
Benzene	1091
Vaseline for External Use	1093
Technical Vaseline Oil	1094
Refined Mineral Oil Grades, 205, 209, 212, 216, 220, 228, 302, 305, 309, 316, 320	1188 thru 1199
Hot Bitumen for Waterproofing	1044
Cold Bitumen for Waterproofing	1045
Determination of Chlorine in Mineral Oil	1166
Medicinal Vaseline Oil	1092
Ethylbenzine. Determination of Tetraethyl Lead	990
Mineral Oil Used in Knitting Industry	1405
Mineral Oils. Nomenclature	871
Refined Mineral Oil, Grade 312	1197
Mineral Oil, Refined, Grade 102	384
Nitrobenzene Technical	933

SWEDEN	SIS
Determination of Acid and Base Numbers	15 02 03
Determination of Saponification Number	15 02 04
Determination of Saponifiable Contents in Lubricants	15 02 05
Determination of Non-Saponifiable Contents in Fatty Oils	16 00 09

UNION OF SOUTH AFRICA	SABS
Thread for Footwear	15/3/15

UNITED KINGDOM	BS
Weft Pirns (Taper Fit) for Direct-Spinning of Cotton	1675:1950

678 Rubber Industry

ARGENTINA	IRAM
Chemical Analysis of Vulcanized Rubber	2062

FRANCE	NF
Rubber Tubes for Domestic Gas Appliances	T 47-114

GERMANY	DIN
Automobile and Bus Tires	7805,B1.1

THE NETHERLANDS	N
Tires for Automobiles and Trailers, 16 in. and 19 in.	7802

NEW ZEALAND	NZSS
Milking Machine Rubberware	519

RUMANIA	STAS
Rubber Gloves for Handling Chemicals	1051

SWEDEN	SIS
Tires for Speeds not over 30 Kmph	35 92 01

691 Building Materials

BRAZIL	IPT
Refractory Clay	89

CHILE	INDITECNOR
Quality and Granulometric Composition of Aggregates in Concrete	2.30-37
Sampling of Aggregates	2.30-38

Building Materials—Chile (Cont'd)

Sieving of Aggregates	2.30-39
Colorometric Method for Determination of the Presence of Organic Impurities in Sand Used in Concrete	2.30-41
Cement Concrete	2.30-62

DENMARK	DS
Hollow Bricks	416

ISRAEL	SI
Concrete Bricks	4
Concrete Hollow Blocks for Walls	5
Clay Hollow Blocks for Non-Load-Bearing Walls	13
Concrete Partition Blocks	18

POLAND	PN
Brick Walls Terminology	B 06061
Building Module	B 02350
Charts for Recording Building Progress	B 07100 through B 07104
Sectional Railing of Reinforced Concrete	B 82000

694 Carpentry, Joinery

FRANCE	NF
Thirteen Standards Series P 23 . . . for different Types of French Windows and Door Wooden Frames	P23-405/7/ 9/11/13/- 17/32/34/- 36/38/54/- 59/61

POLAND	PN
Joinery, Technical and Acceptance Specifications	B 166

693 Masonry, Plasterwork

POLAND	PN
Plasterer's Tool	B 59019
Mason's Jimmy Bar	I 59037
Plasterer's Lining Tool	I 59040

698.1 Painting of Buildings

POLAND	PN
Painter's Comb	I 61029
House-painting Work with Lime-Water Paints	B 06166
House-painting Work with Pebble-containing Paint	B 06168
Painter's Tools	I 61003/4/5
House-painting with Glue-base Paint	B 06167

666.9 Lime, Mortar, Concrete, Cement

BELGIUM	NBN
Cement Tiles. Mosaic Marble Tiles	224-1950

POLAND	PN
Portland Cement, Grade 350	B 30001
Portland Cement, Grade 250	B 30005

URUGUAY	UNIT
Cement Mortar and Concrete Pipes (Revised)	16-50
Flexure Tests of Concrete	74-50
Determination of Clay Lumps in Aggregates	75-50

669 Metallurgy

AUSTRIA	ONORM
Non-alloy Forged or Rolled Steel for Machine Construction	M 3111
Structural Steel Grade "S" for Building and Bridge Construction	M 3114

BRAZIL	IPT
Steel Bars for Automobile Springs	93

POLAND	PN
Pig Iron and Steel Analysis Determination of Clay Content	H 04022
Steel Rods of Different Sections Dimensions	H 94500

SPAIN	UNE
Case Hardening Steel	36014
Spring Steel	36015
Stainless Steel	36016
Heat-resisting Steel	36017
Mild Steel for Easy Machining	36021
Copper. Definition	37101

SWEDEN	SIS
Tensile Test Piece Type "T" for Grey Cast Iron	11 21 29
Tempering Steel, Grade 21-20	14 21 20
Tempering Steel, Grade 22-25	14 22 25
Drawn Steel Key Bars	SMS/17 17/SMS

672 Articles of Iron and Steel

GERMANY	DIN
Anchor Chains	5683,B1.1,2

POLAND	PN
Children's Galvanized Bath Tubs	M 77311/2
Galvanized Dustpans	M 77321
Galvanized Coal Scuttle	M 77324
Galvanized Coal Shovels	M 77351
Painter's Metal Pail	I 61041
Dustpans	M 77321

RUMANIA	STAS
Flat Iron Corners for Window Frames	1435
Barbed Wire	1179

673 Objects of Various Metals Other than Iron and Precious Metals

POLAND	PN
Round Aluminum Containers with Screwed Cover for Travel	M 77025
Aluminum Toilet Soap Container	M 77026
Aluminum Dishes	M 77028/9/0

674 Wood Industry

FRANCE	NF
Percentage of Wood Constituent Substances Soluble in an Alcohol-Benzene Mixture	B 51-014

NEW ZEALAND	NZSS
Code of Practice for the Kiln-drying of Timber	632-1950

POLAND	PN
Beer Barrels	D 79905
Sawn Lumber of Elm Species. Classification	D 96004

667.6/8 Paints, Varnishes, Lacquer

ARGENTINA	IRAM
Zinc Oxide Pigment	1003
Barium Sulfate Pigment	1008
Chrome Yellow Pigment	1046
Interior Varnish	1062
Testing of Lacquer Solvents and Dilutents	1097

INDIA	IS
Method of Test for Drying Oils for Paints	74-1950
Specification for Linseed Oil, Raw, for Paints	75-1950
Specification for Linseed Oil, Refined, for Paints	76-1950
Specification for Linseed Oil, Boiled, for Paints	77-1950
Specification for Linseed Oil, Pale Boiled, for Paints	78-1950
Specification for Stand Oil for Paints	79-1950
Specification for Tung Oil for Paints	80-1950
Specification for Dehydrated Castor Oil, Polymerized, for Paints	81-1950

SWEDEN	SIS
Pigments, Testing for Bleeding Coloring Matter	16 00 06
Pigments. Comparison of Relative Whiteness of White Pigments and Shades of Colored Pigments	16 00 07

676 Paper Industry

THE NETHERLANDS	N
Testing of Paper	1761

NEW ZEALAND	NZSS
School Paper Stationery	362

POLAND	PN
Paper Bags	P 79014

677 Textile Industry

BRAZIL	IPT
White Fabric for Hand Towels	84
White Fabric for Table Cloth	85
Cretonne	86
Stripped Cotton Fabric	90

THE NETHERLANDS	N
Provisional Directives for Textiles Testing	1044

POLAND	PN
Textile Machinery. Heddles	P 63819

RUMANIA	STAS
Fabric for Tire Manufacture, Test Methods	560
Knitted Goods Produced on Kettenstuhl Machines	977
Knitted Goods Produced on Maratti Machines	978
Men's Shirts	1036
Bitumen Impregnated Jute Fabric	1046
Single- and Double-Breasted Men's Suits	1052
Sewing Cotton	1169
Hemp Twine	1170
Cotton Yarn for Knitted Socks	1173

• • **Galvanized Ware Standard** —Proposed by the Galvanized Ware Manufacturers Council, Commercial Standard 169-50, Galvanized Ware Fabricated from Pregalvanized Steel Sheets (for Standardized Grade Items Only) establishes a minimum grade and is available at the Government Printing Office in Washington, D. C.

• • **Government Screw Threads** —The U. S. Department of Commerce has issued the 1950 supplement to Handbook H28 (1944), Screw Thread Standards for Federal Services, which is available in the ASA library. The original handbook, as of last October, sold over 130,000 copies, according to the Government Printing Office.

How ASA Activities Look to Its Council

As reported by Walter C. Wagner, Standards Council Chairman to the Board of Directors April 2

ACTIVITIES in the international field are expanding rapidly. More and more American groups are finding it desirable to have representatives participate in the work of the International Organization for Standardization, the International Electrotechnical Commission, and other international bodies whose technical understandings and standardization work may have a bearing on our national standardization work and on our country's manufacturing problems. The technical committee activities of ISO have resulted in an increasingly larger volume of technical material being received by ASA headquarters for distribution to the American groups concerned.

One of these international committees held a meeting in this country last October. [ISO/TC 45 on Rubber, STANDARDIZATION, December 1950.] Another will hold a meeting next September. [ISO/TC 61 on Plastics.] A rather large American delegation will attend a meeting of another committee which will be held in England in June. [ISO/TC 38 on Textiles.]

[Mr Wagner referred to the special committee that discussed unification of British, American, and Canadian practices in standardization of pipe and fittings (to be reported in a forthcoming issue) and to unification of practices in regard to bolt heads and nuts, see page 191.] The meeting of the International Electrotechnical Commission in Lisbon, Portugal, in July will call for another sizable delegation from this country in order that American points of view can be presented.

These are a few of the international activities which are underway and are mentioned to indicate the spread of the work. In the absence of an outbreak of war, it is expected that such activities will continue to increase, particularly between the three English-speaking countries, and possibly may include other countries.

Emergency Changes Possible

The emergency situation now facing this country has not as yet caused any slackening of national standardization work. Should this emergency continue for an extended period, or should there be an outbreak of total war, an easing off of national standardization activities is to be expected. No emergency standardizing work has as yet been requested of us but such requests might come at any time. ASA will, of course, as in the past, render every service that it can within the framework of its Constitution.

In the ASA, the Building Code and Construction Standards Correlating Committee has anticipated the need for emergency standards in building and construction industries. In a recent meeting it requested the Standards Council to give consideration to the possible adoption of some emergency procedures for the development and approval of emergency standards. Such emergency procedures were in effect during World War II but were later withdrawn. The request of the BCCSCC will be considered at the next meeting of the Standards Council. If considered advisable, the Committee on Procedure will be called upon to develop suitable proposals for the consideration of the Council.

The Board of Directors will remember that several years ago the United States Secretary of Commerce called a meeting in New York which was attended by about 50 executives of leading manufacturing companies. The conference agreed that industry should do a more effective job and should strengthen ASA as the national clearinghouse, financially and otherwise, so that effective machinery would be available. The Secretary of Commerce was advised by the President of ASA at that time that ASA would modify its Constitution to eliminate those provisions which limited its field of activity, would streamline its procedures, and endeavor to obtain the financial support from industry that would be necessary to carry on the work.

Expanding Activities

With respect to the expansion of its field of activity, there has just come to ASA a request for the approval of a standard of a type which could not have been considered under the old Constitution. Reference is made to the proposal for ASA approval of standards for commercial arbitration which have been submitted by the American Arbitration Association.

Not only does the present Constitution permit ASA to process these standards, but the change in the Constitution makes its procedures now available for the development and approval of standards *in any field* to which national standardization lends itself. There appears to be no existing bar to the processing of standard legal procedures such as those for arbitration, in order that such standards might attain the national acceptance and prestige which "American Standard" provides.

Organizations in this country not now affiliated with ASA and many not now participating in our technical

(*Continued on page* 194)

ECONOMICS OF STANDARDIZATION

By Edmund A. Pratt

EARLY in May the ASA asked its Member-Bodies, Associate Members, and Company Members for their cooperation in obtaining data essential to a study of the savings derived from the use of standards in American industry. This study is part of a survey being conducted under the auspices of the Economic Cooperation Administration in order to obtain proof of the savings attributable to standardization. The ECA is pressing forward its current program of increasing productivity in all the Marshall Plan countries, and the wider use of standards is regarded as a powerful means to this end.

The benefits resulting from standardization are apparent to all who have occasion to use standards, but the *measurable* benefits are not always easily expressed in terms of money savings. The adoption of a standard frequently brings about savings in many different stages of an industrial operation and a true evaluation of total savings may extend far beyond the most obvious ones. For instance, adoption of a standard part involves economies all along the line from the purchase of materials to the distribution of a finished product. Or, the use of dimensional coordination of a building material not only eliminates the waste of material but also saves transportation cost, labor cost for cutting, and cost of disposal of wastage; and each piece of material wasted contains elements of cost reaching all the way from raw material, through manufacturing, handling, transporting, etc, to the final cost delivered—ready to waste!

The determination of savings that may be anticipated from the use of a particular standard, or group of standards, thus becomes a question of cost accounting. In a paper presented at the Thirtieth Annual Meeting of the ASA (see *What Good Are Standards?*[1]) Mr William Floyd outlined a method of evaluating a standard which has considerable merit. The procedure is based on the "standard cost" method of accounting, familiar to all accountants. Taking as an example the lower inventories and simplified purchasing resulting from the use of standards, Mr Floyd says:

"It is well within established techniques of standard cost accounting to evaluate these factors. From utilization or demand schedules, it is possible to calculate maximum, minimum, and average inventories, together with the number of orders that must be placed in a year's time. From the number of units and their prices, standard inventories can be calculated. From units, orders, receipts, and stock disbursed, together with time-studies, ordering, receiving, stocking, and disbursing times, standard operating costs can be calculated. Thus,

1. What Good Are Standards? PM 114. Published by American Standards Asscoiation. $1.00 per copy.

WANTED: Quantitative statements of savings of physical resources, manpower, time, and money resulting from the use of standards.

Mr Pratt, well known to readers of STANDARDIZATION *as the ISO Representative at the United Nations, is directing the survey referred to in this article under a contract with ECA. The check list below outlines the type of savings that may be reported. It has been sent to members of ASA with a request for help in compiling the data ECA needs. Illustrative supporting material such as charts and photographs will be welcome.*

Check List of Savings Resulting from Standardization

SAVINGS IN

Procurement

- ☐ Larger quantities of fewer items
- ☐ Buying most economical quantities
- ☐ Use of industry, national, or other standard specifications
- ☐ Reduced volume of accounts, payments, records, etc.
- ☐ Elimination of disputes
- ☐ Broader competition among suppliers

Engineering

- ☐ Variety reduction and interchangeability
- ☐ New designs more readily coordinated with existing products
- ☐ Economies of "modular coordination"
- ☐ Standardized drawings and drafting room practices
- ☐ Accepted standard specifications vs. special specifications

Manufacture

- ☐ Fewer materials and smaller variety of parts
- ☐ Longer runs—continuity of operations
- ☐ Uniformity of operations—simpler training

SAVINGS IN

Manufacture (*Continued*)

- ☐ Easier inspection
- ☐ Improved quality control
- ☐ Maximum mechanization
- ☐ Economies of special-purpose machines
- ☐ Quick interchangeability of machine parts in event of breakdown

Distribution

- ☐ Concentration on reduced variety of products
- ☐ Time element of deliveries
- ☐ Simplified training of personnel
- ☐ Packaging and materials handling
- ☐ Simplified servicing

General

- ☐ Reduced inventories of materials, parts and end products
- ☐ Minimum storage and warehousing costs
- ☐ Most effective use of all physical plant
- ☐ Simplification of office work
- ☐ Improved inter-departmental coordination

if a standardization program reduces stock-keeping units by given percents in different categories, a dollar and cent difference in standard cost, between stocking the larger number of items and the smaller number of items, can be calculated."

Since the "standard cost" method is commonly employed in the evaluation of changes in system, or in change-over from one product to another, Mr Floyd suggests that the same method can be applied, with almost equal facility, to the evaluation of savings due to the use of standards.

Data already available on the savings to be obtained from standardization show that very often it is comparatively easy to arrive at an accurate estimate of savings. An example given by Mr E. H. Weaver of the Union Oil Company of California (STANDARDIZATION, October 1950) is a good illustration. There was formerly a great variety of delivery funnels used by operators of gasoline delivery trucks and the cost of a funnel was $20. After a standardized funnel was adopted by the petroleum industry and the manufacturers, the standard funnel could be bought for $11—a reduction of 45 percent. Another example was given by Mr Thomas D. Jolly, Vice-President of the Aluminum Company of America and ASA President, in an article entitled "The Business Gamble—Purchasing Without the Help of Standards" (see STANDARDIZATION, August 1950). Mr Jolly stated that the elimination of odd sizes and non-standard items had resulted in great savings to his company; for example, the types of special angle cutters for machining dies had been reduced from 57 to 28 with correspondingly larger purchases of each type, resulting in a saving of $10,000 a year for these tools alone. Many other examples could be quoted. It is evident that a vast amount of information of this kind exists. The ECA survey will attempt to assemble it and arrange it on a comparable basis so that it may be of use to those who are faced with similar situations.

In requesting the cooperation of its Members in obtaining specific figures of the money savings from the use of standards, the ASA utilized a "Check List of Savings Resulting from Standardization," indicating under each of the headings of procurement, engineering, manufacture, etc, a number of ways in which savings may be realized. The check list, which is reproduced on page 190, does not claim completeness but it may serve as a reminder of the many ways in which standards are and can be profitably used.

Information is desired not only with reference to savings from the use of American Standards prepared under ASA procedure, but also regarding Company standards, Association standards, industry standards, or standards of any other origin. Data from any source will be welcomed by ASA, whether from members or from firms or persons not affiliated with the Association. All those who contribute examples of savings will receive a report of the study on its conclusion.

London Conference Takes Up Unified Nut and Bolt Dimensions

—From the American Society of Mechanical Engineers, administrative sponsor for the Sectional Committee on Dimensional Standardization of Bolts, Nuts, Rivets, Screws, and Similar Fasteners, B18. The Society of Automotive Engineers is joint sponsor with ASME for this committee's work.

A greater degree of interchangeability of military equipment made in British, Canadian, and American factories was the main objective of a conference held in London recently. Industrial and Armed Services delegates from the three North Atlantic countries attended.

According to H. W. Robb, standards engineer, General Electric Company, chairman of the United States delegation, the conference recommended a basis for standardization of bolt and nut dimensions. This recommendation supplements work formalized in the "Declaration of Accord" signed in 1948 when the three English-speaking countries accepted the principle of a unified screw thread.

The London discussions cleared many obstacles, Mr Robb said. Details of the recommendations made could not be revealed because the delegates must first report back to standardizing bodies in their own countries for ratification.

Because of the urgent defense requirements, it is practically certain that the recommendations will be confirmed and that manufacturers in the three countries will be working to the unified dimensions, in the opinion of the delegates.

Armed Forces delegates at the conference were encouraged by the cooperative spirit of industrial delegates of the three countries. Apart from immediate military significance of recommendations adopted, Mr Robb felt that interchangeability in many industrial products could be expected because of the conference. Already unofficial announcements made by the automotive industries on both sides of the Atlantic indicate that they intend to adopt a unified standard for civilian as well as military production.

In addition to Mr Robb, American delegates were: *Industry*, R. G. Cummings, Ford Motor Company, Dearborn, Mich.; I. H. Fullmer, National Bureau of Standards, U.S. Department of Commerce, Washington, D. C.; C. L. Harvey, technical director, Lamson and Sessions Company; D. H. Samuelson, chief engineer, The National Screw and Manufacturing Company; Mrs D. M. Shackelford, American Society of Mechanical Engineers; W. C. Stewart, Industrial Fasteners Institute, Cleveland, Ohio.

Armed Forces, W. J. Almquist, U.S. Department of Army (Ordnance), Washington, D. C.; R. F. Bosron, U.S. Air Force; H. B. Bothwell, Design Department, Naval Gun Factory, Bureau of Ordnance, Navy Department, Washington, D. C.; Lt Col D. C. Hine, Army General Staff; J. W. Jenkins, Bureau of Ships, Navy Department; Lt Col I. H. Hare, Air Force.

What's New on American Standard Projects

Small Tools and Machine Tool Elements, B5—

Sponsors: Metal Cutting Tool Institute; Society of Automotive Engineers; National Machine Tool Builders' Association; American Society of Mechanical Engineers

A proposed American Standard on Mounting Dimensions of Lubricating and Coolant Pumps for Machine Tools is being circulated for comment and criticism. Foot-mounted, bracket-mounted, and motor-mounted pumps are included.

The standard contains diagrams and tables of dimensions for motor-driven centrifugal pumps (vertical submerged type); mounting brackets —both side-wall and top-of-tank mounting; centrifugal and geared pumps (motor foot-mounting type); centrifugal pumps (flange-mounted type); and gear pumps (foot-mounted).

These dimensions are based on careful consideration of various manufactured pumps, which included a canvass of sixteen motor manufacturers. In some instances the pumps are attached directly to the machine tools. In other cases the pumps are attached to motors which, in turn, are attached to the machine tools.

Copies of this proposed standard may be obtained by writing to D. M. Shackelford, Standards Department, American Society of Mechanical Engineers, 29 West 39 Street, New York 18, N. Y.

Wire and Sheet Metal Gages, B32—

Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers

The proposed revision of the American Standard on Preferred Thicknesses is now being sent to letter ballot of sectional committee B32. Because of the great interest shown in this particular standard, copies of the revision are again being offered to those interested for comment. Copies may be obtained from D. M. Shackelford, Standards Department, American Society of Mechanical Engineers, 29 West 39 Street, New York 18, N. Y.

The standard provides a simple system for designating the thicknesses of uncoated, thin, flat metals and alloys in decimal parts of an inch. This eliminates the confusion caused by the use of different gage number systems in the various metal industries.

The new series of thicknesses is based on the 40-series of preferred numbers. This gives a step-up of about six percent between each two consecutive thicknesses, as against about twelve percent in the existing standards, which is based on the 20-series of preferred numbers. The new standard covers a variety of thicknesses which for all practical purposes is equivalent to that of the previous gage systems.

For general purpose applications the committee feels that the simplified preferred thicknesses given in the standard will facilitate interchangeability of different metals in design, reduce inventory, and increase the availability in warehouse stocks of thicknesses commonly required for general-purpose applications.

Electrical Equipment in Coal Mines, M2—

Sponsors: American Mining Congress; U. S. Department of Interior, Bureau of Mines

A subcommittee of four members has been appointed to meet with representatives of the Electric Light and Power Group and the Telephone Group to study a proposed American Standard Safety Code for Installing and Using Electrical Equipment in and about Coal Mines, M2.1. This group will harmonize any conflicts that may be found between this proposed American Standard and other electrical standards approved as American Standard. A. Lee Barrett, Joy Manufacturing Company, Franklin, Pa. (representing both the American Mining Congress and the American Institute of Mining Engineers); E. J. Gleim, electrical engineer, U. S. Bureau of Mines; R. N. Hunter, Rochester and Pittsburgh Coal Co, Indiana (representing the American Mining Congress); and R. L. Lloyd, safety engineer, National Bureau of Standards, make up the subcommittee of M2.

W. C. Wagner, Philadelphia Electric Company, is the Electric Light and Power Group representative, and S. B. Graham, American Telephone and Telegraph Company, will represent the Telephone Group.

Safety Code for Exhaust Systems, Z9—

Sponsors: American Industrial Hygiene Association; American Society of Heating and Ventilating Engineers; National Association of Fan Manufacturers

Subcommittee on Solid Materials Handling — As a result of the Z9 meeting, April 27, this subcommittee will prepare two separate drafts on solid materials handling — one for foundry operations, and the other for grain handling. The subcommittee found several vital differences between the handling of grain and the handling of foundry materials and suggested two separate drafts.

Subcommittee on Surface Coating Operations—A proposed standard on surface coating operations is expected to be ready for distribution to the full Z9 committee early next Fall.

Subcommittee on Fundamentals—The subcommittee has almost completed its work on a draft of a good practice manual. This manual will include nine sections on: shape and design of hoods, properties involved in capturing certain substances, collectors, inspection, and maintenance of equipment. Specific references to particular industries will not be included. The Z9 committee will develop special codes for each particular industry as needed.

A copy of the industrial ventilation manual of recommended practice, published by the American Conference of Governmental Industrial Hygienists (January, 1951), was presented to the committee. This subcommittee on fundamentals will try to coordinate its work with that already done by the ACGIH so as to avoid duplication of effort.

Ventilation and Operation of Open-Surface Tanks—A request for an interpretation of the following sentence from paragraph 2.1.1 of the recent standard on open-surface tanks, Z9.1-1950, was received by the committee:

> The relative explosion hazard is measured in terms of the open-cup flash point (flash point) of the substance in the tank in degrees of Fahrenheit.

The use of the term "open-cup" without reference to the closed cup methods was questioned. It was explained that both open-cup and closed-cup methods are used to determine flash point. The difference in methods might account for a difference of 5 to 10 degrees F in the temperature of the flash point. The committee feels that this difference probably is not too important as far as the use of the standard is concerned. However, they voted that in any reprinting of Z9.1-1950 the following change should be made, with the understanding that it is an editorial correction:

> The words "open-cup" and "(flash point)" should be deleted in 2.1.1 so that the sentence would read: "The relative explosion hazard is measured in terms of the flash point of the substance in the tank in degrees Fahrenheit."

New Subcommittees—The need for two new subcommittees was agreed upon at the April 27 meeting. A subcommittee will be organized on mechanical cutting and abrading operations to include the study of all operations involving cutting, machining, sanding, grinding, polishing, buffing, snagging, sawing, or other similar operations on wood, plastics, rubber, metal, or other solid materials.

A second subcommittee will be formed on abrasive blasting operations to cover the process of blasting metal or other materials by means of abrasive or metallic particles to remove sand, rust, scale, or paint; to produce certain finishes; or to change the physical characteristics of the material.

Optics, Z58—

Sponsor: Optical Society of America

Subcommittee 1 on Nomenclature—As a result of the Z58 meeting, March 1, a subgroup is being formed on nomenclature in the field of crystal optics. Dr W. C. McCrone of the Armour Institute of Technology has agreed to act as chairman of this group.

Subcommittee 3 on Optical Filters and Polarizers—In order to define its area of operations, the committee is in the process of setting up a system for classification of filters. The classification is expected to be threefold: on a constructional basis—liquid, solid glass, solid plastic, laminated-in-glass, etc; on a functional basis—spectral isolation, neutral, polarizing, etc; and on a physical basis—absorption, scattering, interference, etc.

Studies are under way regarding methods for specifying the stability of color filters and polarizers.

A survey has also been made of methods currently in use for the presentation of transmission data for color filters and polarizers. This survey will form the basis for recommending standard procedure.

Attention is also being paid to methods for specifying heat-absorbing filters, which are sufficiently different from visual filters to warrant special treatment.

Subcommittee 8 on Vision—The subgroup on visual acuity tests has been working with small groups from several professional societies with the hope of forming an Intersociety Acuity Council to promote standardization in this area.

A subgroup on experimental conditions for research is being established. This group will work with the United States National Committee of the International Commission on Optics. Professor S. S. Ballard, chairman of the U.S. National Committee, is trying to obtain a consensus among vision researchers in this country concerning possible standardization of some of the conditions for research.

Pipe Fittings Standard Published

The new American Standard on Malleable-Iron Screwed Fittings, 300 Lb, B16.19-1951, just published, is a companion document to the American Standard Malleable-Iron Screwed Fittings, 150 Lb, B16c-1939.

The 300 psi fittings are used primarily for very severe piping applications in the petroleum industry; for oil and gasoline lines; for railroads, ships, and diesel engines; and for steam at high pressures.

Pressure-temperature ratings as given in the standard are: Liquid and gas at 150 F, ¼ to 1 inch, inclusive, 2000 psi; 1¼ to 2 inch, inclusive, 1500 psi; 2½ and 3 inches, 1000 psi. The steam and oil rating for ¼ to 3 inches, inclusive, is 300 psi, at 550 F.

The standard gives dimensions for elbows, 45-degree elbows, tees and crosses (straight sizes); center-to-end dimensions of 90 degree elbows (reducing sizes) and tees (reducing sizes); and dimensions of couplings, reducing couplings, caps, street elbows, and return bends.

A committee organized under ASA procedure and pointly sponsored by the American Society of Mechanical Engineers; the Manufacturers Standardization Society of the Valve and Fittings Industry; and the Heating, Piping, and Air Conditioning Contractors National Association developed this standard.

Copies of the American Standard Malleable-Iron Screwed Fittings, 300 Lb, B16.19-1951, are now available at 60 cents per copy.

Accidents

(*Continued from page* 186)

At the hospital his brother told the doctor that he had advised the patient to take it easy during the day, as he had not been feeling well.

During Saturday afternoon and all day Sunday, July 11 and 12, deceased had been cutting hay on the farm. It was also learned from his folks that during Sunday he had drunk considerable water, flavored with lemon and blueberry juices.

It was the opinion of some people that this man would have passed away, regardless of his work on July 13, because of his strenuous haying activities on July 11 and 12. It was for this reason that the company wanted to know if this fatality should be included in their industrial injury rates.

The committee agreed that this should be counted as a fatal case in the injury rates.

Some of the members remarked that while some of the strenuous work done by the employee during the previous two days at home may have changed his physical condition, they believed that it was fair to assume that the strenuous work done during high temperatures on Monday was either directly responsible, or else it aggravated the condition of this employee and therefore was indirectly responsible for the fatality.

Piping Schedules

(*Continued from page* 174)

being designed for 475 psig steam superheated to 700 F? Assume that Grade B carbon steel pipe will be used conforming to ASTM Specification A106 and having an allowable stress (*S* value) of 11,400 psi at 700 F.

Solution: $1000\ P/S = (1000 \times 475)/11,400 = 41.6$.

Referring to the chart, it is evident that all sizes of Schedule 40 pipe are a safe margin above the $1000\ P/S = 41.6$ ordinate of the chart. Hence if the pipe is to be used with plain ends, Schedule 40 will be acceptable throughout.

Example 2—Complex Case Where More Than One Schedule Is Required.

Problem: What pipe schedules should be used for a steam system being designed for 1500 psig and 1000 F?

Assume that chromium-molybdenum alloy steel pipe having an allowable stress (*S*-value) of 6250 psi at 1000 F will be used.

Solution: $1000\ P/S = (1000 \times 1500)/6250 = 240$.

Referring to the condensed graphs in the lower left-hand corner of the chart, it appears that all sizes of double-extra-strong pipe smaller than 4 in. size are above the 240 ordinate and hence are adequate for this service. It is further evident that the 1 in. and smaller sizes of Schedule 160 pipe are adequate. Hence, the decision should be to use 1-in. Schedule 160 pipe, and $1\frac{1}{4}$ to 4 in. inclusive double-extra-strong pipe.

The 5-in. and 6-in. sizes of double-extra-strong are just short of meeting the required 1000 *P/S* value of 240 but are almost close enough to qualify under the code provision that "When computing the allowable pressure for a pipe of a definite minimum wall thickness, the valve value obtained by the formula may be rounded out to the next higher unit of 10." For practical purposes, 5-in. and 6-in. double-extra-strong pipe should be acceptable for these conditions, and permission could be sought from state or municipal authorities for their use, or discretion exercised where conforming with codes is not mandatory.

For pipe sizes 8 in. and larger, none of the standard thicknesses are adequate for these conditions and special thicknesses will have to be ordered to suit mill practice and choice of manufacturing method.

Standards Council

(*Continued from page* 189)

standardization, would, by the acceptance of this proposal, have the possibilities of standardization in other fields brought to their attention for the first time, if the Miscellaneous Projects Correlating Committee, to whom this proposal was referred, determines upon the policy that this properly falls within the intent and scope of our Association.

The technical director of ASA reports that other groups which previously have had little or no contact with ASA have been making inquiries concerning ASA services and operations.

ASTM Symposium on Measuring Consumer Wants

How to measure what the consumer wants will be the subject of a two-session Symposium at the annual meeting of the American Society for Testing Materials June 21. ASTM's Administrative Committee on Ultimate Consumer Goods has found that standards for consumer goods must be based on what consumers want. The Symposium is intended to give engineers information on scientific developments in "Measurement of consumer wants."

In the first session representatives of the U.S. Quartermaster Corps will discuss problems associated with determining soldier wants. The program (at 2:00 P.M. Thursday, June 21) includes:

Determination of Soldier Wants. Joseph C. Katin, Quartermaster Corps.

Determination of Soldier's Food Wants. R. Benedict, Quartermaster Corps.

Discussion. David R. Peryam, Quartermaster Corps.

The second session (at 8:00 P.M. Thursday, June 21) includes:

The General Problem of Measurement. Samuel A. Stouffer, Harvard University.

Interviewer Bias. Clyde Hart, University of Chicago.

Some Application of the Panel Technique in Social Research. Charles Y. Gloch, Columbia University.

Effective Sampling Procedures. F. F. Stephan and P. J. McCarthy, Princeton University.

• • **Almost 1,000 questions** on standards were answered by American Standards Association's Library staff during 1950. Typical inquiries —What are the Federal Trade Commission rulings on vacuum tubes?—Please furnish the British standard on galvanized wire.—What is meant by RLM standards?—Is there a government specification for silver?—Please supply the German standard for brass pipe symbols MS 60 and F 34.

AMERICAN STANDARDS

Status as of May 9, 1951

Legend

Standards Council — Approval by Standards Council is final approval as American Standard; usually requires 4 weeks

Board of Review—Acts for Standards Council, gives final approval as American Standard; usually requires 2 weeks

Correlating Committees — Approve standards to send to Standards Council or Board of Review for final action; approval by correlating committee usually takes 4 weeks

Arbitration

Submitted to ASA for Approval—

Standards for Commercial Arbitration

Sponsor: American Arbitration Association

Building

American Standards Just Published—

Specifications for Structural Clay Floor Tile ASTM C57-50; ASA A77.1-1951 $.25

Specifications for Seamless Copper Water Tube ASTM B88-49; ASA H23.1-1951 $.25

Specifications for Leaded Red Brass (Hardware Bronze) Rods, Bars, and Shapes ASTM B140-49; ASA H33.1-1951 $.25

Sponsor: American Society for Testing Materials

American Standards Just Approved—

Specifications for Gypsum ASTM C22-50; ASA A49.1-1951

Methods of Testing Gypsum and Gypsum Products ASTM C26-50; ASA A70.1-1951

Specifications for Gypsum Plasters ASTM C28-50; ASA A49.3-1951

Specifications for Gypsum Wall Board ASTM C36-50; ASA A69.1-1951

Specifications for Gypsum Lath ASTM C37-50; ASA A67.1-1951

Specifications for Gypsum Molding Plaster ASTM C59-50; ASA A49.4-1951

Specifications for Keene's Cement ASTM C61-50; ASA A66.1-1951

Specifications for Gypsum Sheathing Board ASTM C79-50; ASA A68.1-1951

Sponsor: American Society for Testing Materials

Preparation of Subfloors to Receive Oxychloride Composition Flooring, A88.1-1951

General Purpose Oxychloride Composition Flooring and Its Installation, A88.2-1951

Heavy Duty Oxychloride Composition Flooring and Its Installation, A88.3-1951

Oxychloride Composition Basecoat Flooring and Its Installation, A88.4-1951

Sponsors: National Bureau of Standards; American Society for Testing Materials

In Correlating Committee—

Method of Making and Curing Concrete Compression and Flexure Test Specimens in the Field (ASTM C31-49; Revision of ASA A37.17-1948)

Method of Test for Compressive Strength of Molded Concrete Cylinders (ASTM C39-49; Revision of ASA A37.18-1948)

Method of Test for Organic Impurities in Sands for Concrete (ASTM C40-48; Revision of ASA A37.19-1948)

Methods of Securing, Preparing and Testing Specimens from Hardened Concrete for Compressive and Flexural Strengths (ASTM C42-48; Revision of ASA A37.20-1948)

Method of Test for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading) (ASTM C78-49; Revision of ASA A37.22-1948)

Method of Test for Compressive Strength of Concrete Using Portions of Beams Broken in Flexure (Modified Cube Method) (ASTM C116-49; Revision of ASA A37.24-1948)

Method of Test for Amount of Material Finer Than No. 200 Sieve in Aggregates (ASTM C117-49; Revision of ASA A37.-4-1943 R 1948)

Method of Measuring Length of Drilled Concrete Cores (ASTM C174-49; Revision of ASA A37.31-1948)

Method of Test for Penetration of Bituminous Materials (ASTM D5-49; Revision of ASA A37.1-1930 R 1948)

Definition of Terms Relating to Materials for Roads and Pavements (ASTM D8-49; Revision of ASA A37.33-1948)

Method of Sampling Stone, Slag, Gravel, Sand and Stone for use as Highway Materials A37.75 (ASTM D75-48; Revision of ASA A26-1930)

Specifications for Calcium Chloride (ASTM D98-48; Revision of ASA A37.37-1948)

Method of Testing Emulsified Asphalts (ASTM D244-49; Revision of ASA A37.-42-1948)

Method of Float Test for Bituminous Materials (ASTM D139-49; Revision of ASA A37.2-1930 R 1948)

Recommended Practice for Bituminous Mixing Plant Inspection (ASTM D290-49T; Revision of ASA A37.43-1948)

Methods of Sampling and Testing Calcium Chloride (ASTM D345-48; Revision of ASA A37.44-1948)

Specification for Asphalt Plank (ASTM D517-50; Revision of ASA A37.48-1948)

Method of Test for Sulfonation Index of Road Tars (ASTM D872-48; Revision of ASA A37.59-1948)

Specification for Emulsified Asphalt (ASTM D977-49—formerly D631-46; Revision of ASA A37.55-1948)

Specification for Ready-Mixed Concrete (ASTM C94-48; ASA A37.69)

Method of Test for Air Content of Freshly Mixed Concrete by the Pressure Method (ASTM C231-49T; ASA A37.70)

Method of Test for Specific Gravity of Road Oils, Road Tars, Asphalt Cements and Soft Tar Pitches (ASTM D70-27; ASA A37.71)

Method of Test for Specific Gravity of Asphalts and Tar Pitches Sufficiently Solid to be Handled in Fragments (ASTM D71-27; ASA A37.72)

Method of Test for Distillation of Cut-Back Asphaltic Products (ASTM D402-49; ASA A37.45)

Sponsor: American Society for Testing Materials

Building Exits Code, A9.1 (Revision of A9.1-1948)

Sponsor: National Fire Protection Association

Submitted to ASA for Approval—

Building Code Requirements for Reinforced Concrete (ACI 318-47), A89.1 (Revision of A89.1-1948)

Sponsor: American Concrete Institute

Pile Foundations and Pile Structures, A96

Sponsor: American Society of Civil Engineers

Reaffirmation Requested—

Method of Test for Toughness of Rock (ASTM D3-18; ASA A5-1930—to be ASA A37.73)

Specifications for Materials for Cement Grout Filler for Brick and Stone Block Pavements (ASTM D57-29; ASA A31-1924—to be A37.74)

Requested by: American Society for Testing Materials

Consumer

American Standards Just Published—

General Methods of Testing Cotton Fibers, ASTM D 414-49T; ASA L14.23-1951 $.25

Methods of Testing and Tolerances for Single Jute Yarn, ASTM D 541-49; ASA L14.34-1951 $.25

General Methods of Testing Woven Textile Fabrics, ASTM D 39-49; ASA L5-1951 $.25

Sponsors: American Society for Testing Materials; American Association of Textile Chemists and Colorists

Electrical

American Standards Just Published—

Audiometers for General Diagnostic Purposes, Z24.5-1951 $.50

Sponsor: Acoustical Society of America

Rolled Threads for Screw Shells of Electric Lamp Holders and Lamp Bases, C81.1-1951 $.35

Electrical Standards Published (Cont'd)

Dimensional and Electrical Characteristics of 4-Watt T-5 Preheat Start Fluorescent Lamp, C78.401-1951 $.25

Dimensional and Electrical Characteristics of 6-Watt T-5 Preheat Start Fluorescent Lamp, C78.401-1951 $.25

Dimensional and Electrical Characteristics of 8-Watt T-5 Preheat Start Fluorescent Lamp, C78.402-1951 $.25

Dimensional and Electrical Characteristics of 14-watt T-12 Preheat Start Fluorescent Lamp, C78.403-1951 $.25

Dimensional and Electrical Characteristics of 20-Watt T-12 Preheat Start Fluorescent Lamp, C78.406-1951 $.25

Dimensional and Electrical Characteristics of 15-Watt T-8 Preheat Start Fluorescent Lamp, C78.404-1951 $.25

Dimensional and Electrical Characteristics of 30-Watt T-8 Preheat Start Fluorescent Lamp, C78.407-1951 $.25

Dimensional and Electrical Characteristics of 85-Watt T-17 Preheat Start Fluorescent Lamp, C78.409-1951 $.25

Dimensional and Electrical Characteristics of 40-Watt T-12 Preheat Start Fluorescent Lamp, C78.408-1951 $.25

Dimensional and Electrical Characteristics of 100-Watt T-17 Preheat Start Fluorescent Lamp, C78.410-1951 $.25

Dimensional and Electrical Characteristics of 42-Inch T-6 Instant-Start Single-Pin Hot-Cathode Fluorescent Lamp, C78.801-1951 $.25

Dimensional and Electrical Characteristics of 64-Inch T-6 Instant-Start Single-Pin Hot-Cathode Fluorescent Lamp, C78.803-1951 $.25

Dimensional and Electrical Characteristics of 72-Inch T-8 and Instant-Start Single-Pin Hot-Cathode Fluorescent Lamp, C78.-805-1951 $.25

Dimensional and Electrical Characteristics of 96-Inch T-8 Instant-Start Single-Pin Hot-Cathode Fluorescent Lamp, C78.807-1951 $.25

Dimensional and Electrical Characteristics of 20-Millimeter 52-Inch Cold-Cathode Fluorescent Lamp, C78.1100-1951 $.25

Dimensional and Electrical Characteristics of 20-Millimeter 64-Inch Cold-Cathode Fluorescent Lamp, C78.1101-1951 $.25

Dimensional and Electrical Characteristics of 20-Millimeter 84-Inch Cold-Cathode Fluorescent Lamp, C78.1103-1951 $.25

Dimensional and Electrical Characteristics of 20-Millimeter 76-Inch Cold-Cathode Fluorescent Lamp, C78.1102-1951 $.25

Dimensional and Electrical Characteristics of 8-Watt T-5 Bactericidal Lamp, C78.-1200-1951 $.25

Dimensional and Electrical Characteristics of 15-Watt T-8 Bactericidal Lamp, C78.-1201-1951 $.25

Dimensional and Electrical Characteristics of 20-Millimeter 93-inch Cold-Cathode Fluorescent Lamp, C78.1105-1951 $.25

Dimensional and Electrical Characteristics of 30-Watt T-8 Bactericidal Lamp, C78.-1202-1951 $.25

Sponsor: Electrical Standards Committee

American Standards Just Approved—

Dimensional and Electrical Characteristics of 32-Watt T-10 12-Inch Circular Fluorescent Lamp, C78.413-1951

Dimensional and Electrical Characteristics of 40-Watt T-12 Instant-Start Fluorescent Lamp, C78.600-1951

Dimensional and Electrical Characteristics of 48-Inch T-12 Instant-Start Single-Pin Hot-Cathode Fluorescent Lamp, C78.808-1951

Dimensional and Electrical Characteristics of 40-Watt T-7 Instant-Start Fluorescent Lamp, C78.601-1951

Dimensional and Electrical Characteristics of 72-Inch T-12 Instant-Start Single-Pin Hot-Cathode Fluorescent Lamp, C78.809-1951

Dimensional and Electrical Characteristics of 96-Inch T-12 Instant-Start Single-Pin Hot-Cathode Fluorescent Lamp, C78.810-1951

Sponsor: Electrical Standards Committee

Landscaping

Submitted to ASA for Approval—

Nursery Stock, Z60.1 (Revision of Z60.1-1949)

Sponsor: American Association of Nurserymen

Mechanical

American Standards Just Published—

Method of Rating and Testing Refrigerant Expansion Valves, B60.1-1951 $.50

Sponsor: American Society of Refrigerating Engineers

American Standards Just Approved—

Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe, B36.20-1951 (Revision of ASTM A120-46; ASA G8.7-1947)

Sponsor: American Society for Testing Materials

Steel Butt-Welding, B16.9-1951 (Revision of B16.9-1940)

Sponsors: American Society of Mechanical Engineers; Manufacturers Standardization Society of the Valve and Fittings Industry; Heating, Piping, and Air Conditioning Contractors' National Association

Drill Drivers, Split-Sleeve, Collet Type, B5.27-1951

Sponsors: American Society of Mechanical Engineers; Metal Cutting Tool Institute; National Machine Tool Builders' Association; Society of Automotive Engineers

Inspection of Fine Pitch Gears, B6.11-1951

Sponsors: American Society of Mechanical Engineers; American Gear Manufacturers Association

In Board of Review—

Tolerances for Ball and Roller Bearings, B3.5

Sponsor: Mechanical Standards Committee

In Correlating Committee—

Terminology and Definitions for Anti-Friction Ball and Roller Bearings and Parts, B3.7

Sponsor: Mechanical Standards Committee

Mining

American Standard Just Published—

Tumbler Test for Coke ASTM D294-50; ASA K20.3-1951 (Revision of ASTM D294-29; ASA K20.3-1936) $.25

Sponsor: American Society for Testing Materials

In Board of Review—

Safety Code for Installing and Using Electrical Equipment in and About Coal Mines, M2.1 (Revision of M2-1926)

Sponsors: American Mining Congress; Bureau of Mines, U. S. Department of Interior

Motion Picture

American Standards Just Approved—

Cutting and Perforating Dimensions for 32-mm on 35-mm Motion Picture Negative Raw Stock, PH22.73-1951

Zero Point for Focusing Scales on 16-mm and 8-mm Motion Picture Cameras, PH22.74-1951 (Revision of American War Standard Z52.51-1946)

Mounting Threads and Flange Focal Distances for Lenses on 16-mm and 8-mm Motion Picture Cameras, PH22.76-1951 (Revision of American War Standard Z52.50-1946)

Sponsor: Society of Motion Picture and Television Engineers

Office Equipment

In Correlating Committee—

Size Designation for Index Cards and Record-Keeping Cards, X2.4.1

Dimensions of Desks and Tables for General Office Use, X2.1.1

Sponsor: National Office Management Association

Optics

American Standards Just Approved and Published—

American Standard Methods of Measuring and Specifying Color $.50

Includes

Method of Spectrophotometric Measurement of Color, Z58.7.1-1951 (Revision of Z44-1942)

Method for Determination of Color Specifications, Z58.7.2-1951 (Revision of Z44-1942)

Alternative Methods for Expressing Color Specifications, Z58.7.3-1951 (Revision of Z44-1942)

Sponsor: Optical Society of America

Petroleum Products and Lubricants

American Standards Just Published—

Test for Sulfur in Petroleum Products and Lubricants by Bomb Method; Z11.13-1950 (Revision of ASTM D 129-49; ASA Z11.13-1949) $.25

Test for Saponification Number of Petroleum Products by Potentiometric Titration (ASTM D 939-50; ASA Z11.67-1950) $.25

Test for Interfacial Tension of Oil Against Water by the Ring Method (ASTM D 971-50; ASA Z11.64-1950) $.25
Sponsor: American Society for Testing Materials

Photography

American Standards Just Aproved—

Dimensions for Film Pack, Z38.1.1-1951 (Revision of Z38.1.1-1941 and Z38.1.2-1941)
Dimensions for 35-mm Magazine Film (For Miniature Cameras), Z38.1.49-1951 (Revision of Z38.1.49-1948)
Dimensions of Photographic Double Film Holders of the Lock-Rib Type, Z38.1.51-1951
Dimensions of 16-mm 100-ft Film Spool for Recording Instruments and Still Picture Cameras, Z38.1.52-1951
Dimensions of 16-mm 200-ft Film Spool for Recording Instruments and Still Picture Cameras, Z38.1.53-1951
Dimensions of 35-mm 100-ft Film Spool for Recording Instruments and Still Picture Cameras, Z38.1.54-1951
Dimensions of 70-mm 100-ft Film Spool for Recording Instruments and Still Picture Cameras, Z38.1.55-1951
Sponsor: Optical Society of America

News Briefs

• • **Natural Building Stones**—A proposed new specification for roofing slate received attention at the recent meeting of ASTM Committee C-18 on Natural Building Stones, at the National Bureau of Standards, Washington, D. C. This specification will cover natural slate shingles as commonly used on sloping roofs and also square or rectangular tiles for flat roof coverings. Three grades are contemplated, based on service periods running from 20 to 100 yrs with requirements for modulus of rupture across the grain and maximum absorption limits. Action to approve this specification was postponed pending the study of further data from round-robin tests.

Action on another proposed specification for exterior marble will also be held up for a period of six months, pending further data on research being conducted by the National Association of Marble Producers. The Committee was informed of the progress which has been made in the research program being conducted by the Association, at Mellon Institute.

The need for standard definitions was discussed, especially terms to describe grain size, texture, color, finish, polish, and hone. A standard method is needed to measure and classify grain size, and the use of photographs was proposed for study.

The findings to date on the behavior of various building stones and mortars in the exposure test wall at the National Bureau of Standards was outlined by D. W. Kessler. A more detailed report will be distributed to the Committee. This test wall contains building stones from forty-seven states and sixteen foreign countries and includes granite, slate, marble, limestone, and sandstone with two types of mortar, namely, portland cement and lime. The problems under study consist of the effect of weathering, physical properties of stone setting mortars, relation of discolorations to type of mortar, watertightness of joints, durability of mortars, structural movements, and other interesting data concerning joints. This project is a cooperative research initiated by the National Bureau of Standards and the American Society for Testing Materials.

Officers of Committee C-18 are: L. W. Currier, U.S. Geological Survey, Washington, D. C., chairman; F. S. Eaton, Research and Design Institute, New Haven, Conn., secretary.

• • **Standard Endorsed** — The Commercial Standard CS155-50, Body Measurements for the Sizing of Boys' Apparel (Knit Underwear, Shirts and Trousers) has just been endorsed by the boys' outerwear apparel industry — the producers of boys' jackets, mackinaws, surcoats, storm-coats and related garments. The title of the standard will be amended by the addition of "Outerwear" at the first reprinting of the standard.

• • British and American engineers concerned with standardization of piping practices in the petroleum industry met April 10-13, 1951 in the Engineering Societies Building, New York. The British delegation was headed by three liaison members of the ASA sectional committees on pipe flanges and flanged fittings, B16; code on pressure piping B31; and wrought iron and wrought steel pipe and tubing, B36. They are:

A. C. McGechan, Anglo-American Oil Company, London
H. J. Zass, Anglo-Iranian Oil Company, London
C. Schimmel, N. V. de Bataafsche Petroleum Mij., The Hague, Netherlands

The meeting was arranged at the suggestion of the British Standards Institution in order to discuss with the American sectional committees B16, 31, and 36, of which the American Society of Mechanical Engineers is administrative sponsor, such subjects as: joint efficiencies; allowable stresses; temperature and stress limitations on butt and lap welded pipe; mill test pressures in relation to allowable stress and joint efficiency; wall thickness formulas; minimum wall thickness of piped fittings; fabricated pipe work; and pressure temperature ratings for equipment made of austenitic materials.

• • **Letterpress Inks to Be Standardized**—The Standards Council of South Africa has set up a technical committee to prepare specifications for four-color letterpress inks. The Council's action was taken at the request of the South African Tourist Corporation, which produces a large quantity of publicity material containing four-color illustrations for overseas distribution. To compete with other countries successfully, the Corporation pointed out, its publicity material must compare favorably with the best work of other countries.

• • **New CSA Office**—The Canadian Standards Association announces that a branch office is being opened in Vancouver. The engineer in charge will be responsible for factory inspection of electrical equipment and domestic oil-burning

equipment produced in British Columbia and the West Coast of the U. S. and intended for sale and distribution as CSA-approved equipment.

• • **McGraw Award to Frank Thornton, Jr**—The James H. McGraw Award, Manufacturers Medal for 1950 was awarded to Frank Thornton, Jr, engineering manager, Association Activities, Westinghouse Electric Corporation. He is First Vice-Chairman of the NEMA Codes and Standards Committee and has been a member of ASA's Standards Council from 1937 until last year, when he was made an alternate. Mr Thornton was cited for his distinguished contribution to the advancement of the electrical industry in the field of standardization, code development, and safety regulations. In Europe this summer, as an observer for American industry, Mr Thornton is now in Finland for the CEE (International Commission on Rules for Approval of Electrical Equipment).

• • **New Head of Board of Review, Procedure Committee**—T. E. Veltfort, Manager of the Copper and Brass Research Association, has been elected chairman of ASA's Board of Review for the year 1951. Chairman of the Committee on Procedure for the past three years, Mr Veltfort had to give up his duties in that capacity in order to assume the more pressing responsibilities of his new position. Mr Veltfort succeeds J. R. Townsend, materials engineer, Bell Telephone Laboratories, who served as chairman for the past three years.

Richard C. Kimbell, Director, Technical and Standards Department, National Lumber Manufacturers Association, is now chairman of the Committee on Procedure.

• • **Plastic Standard Available**—Printed copies of Commercial Standard 168-50, Polystyrene Plastic Wall Tiles and Adhesives for Their Application, may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Proposed Federal Specifications

Although the following proposed Federal Specifications have been published by the Federal Supply Services, they are still under development. Any and all comments will be welcomed by the Standards Division. Send to the Director, Standards Division, Federal Supply Service, General Services Administration, Washington 25, D. C.

Copies of these specifications can be consulted at the Library of the American Standards Association.

Title of Specification

2119 Ethylene Glycol Mono Ethyl Ether
2124 Calcium Hydroxide, Technical Grade
2136 Potassium Hydroxide, Photographic Grade
2137 Chlorhydrochinone, Photographic Grade
2142 Sodium Hydroxide, Photographic Grade
2150 Nails, Wires; and Staples
2152 Pockets and Wallets; Paper (File)
2134 Citric Acid, Photographic Grade
2138 Sodium Sulfate (Anhydrous), Photographic Grade
2140 Potassium Persulfate, $K_2S_2O_8$, Photographic Grade
2147 Soda-Lime
2148 Fiberboard, Corrugated, Single-face (flexible)
2154 Paper; Building, Waterproofed
2139 Potassium Chloride, Photographic Grade
2141 Sodium Chloride, Photographic Grade
2158 Chair, Wood, Executive Office

• • **W. E. Mallalieu Honored**—Wilbur E. Mallalieu was honored at a dinner in Chicago on April 20 for 50 years service with the National Board of Fire Underwriters' Laboratories, Inc. In citing Mr Mallalieu, W. Ross McCain, president of the Board, said: "One of the most constructive and beneficial influences in the business, Mr Mallalieu has been a leader in the expansion of public services of fire insurance." Under his supervision, engineering surveys of American cities have been made to detect conflagration hazards; a division of research which studies new fire hazards in industry has been established; successive editions of the National Board's model building code have been published; and the "Catastrophe Plan," a procedure enabling fire insurance companies to bring quick aid to stricken communities after major disasters such as explosions, fires, and hurricanes has been set up. Mr Mallalieu has also served for 40 years on the Board of Trustees of Underwriters' Laboratories, Inc, and is secretary of its investment and banking committee.

• • **The Inch Covers More Territory**—Senator Ralph E. Flanders' "How Big is an Inch?" has attracted favorable attention in other countries. At the request of Dr Paulo Sa, General Secretary of the Associação Brasileira de Nomas Técnicas, the article will be translated into Portuguese for distribution in Rio de Janeiro.

• • **Uniform Safety Standards**—A Special Committee on Machinery Safeguarding, appointed by the National Safety Council, is urging that American Standard safety codes be used in government operations and in war contract plant operations. Letters have gone to W. L. Connolly, director of the Federal Safety Council, and to C. E. Wilson, director of the Office of Defense Mobilization, transmitting the committee's recommendations. The committee works under the chairmanship of J. C. Stennett, Director of the Accident and Fire Protection Division, National Association of Casualty Companies. It asks that the Federal Safety Council recommend that all federal agencies use American Standards where applicable in specifications for the design, construction, and layout of facilities and in the purchase specifications for machinery, tools, and equipment. It asks the Office of Defense Mobilization to suggest to the officials of war contract plants that American safety standards be used in their specifications for the design, construction, and layout of plant facilities as well as for adequate mechanical safeguarding of machinery, tools, and equipment that may be installed and used. Such a recommen-

dation would go far in reducing manpower losses due to accidental injury in our critical industries and in encouraging the use of acceptable standards, Ned H. Dearborn, president of the National Safety Council, declares in transmitting the request of the Special Committee to Mr Wilson.

The Special Committee on Machinery Safeguarding has been greatly aided by the two research studies made by the Bureau of Labor Standards on woodworking machinery and on power presses, F. W. Braun, chairman of the Industrial Conference, declares in his letter to Mr Connolly.

Brazil

(*Continued from page* 179)

preciated. During the same period ASA has been provided with copies of all available reports and standards produced locally.

To quote from a recent ASA publication:

"Progressive industrial executives increasingly recognize the value of standardization in coordinating such functions as designs, production, inspection, purchasing, and sales. And since coordination plays a vital part in management, top executives in many companies are now having installed, under their direct supervision, administrative machinery for developing, introducing, maintaining, and keeping up-to-date, the standards required by their companies for operating harmoniously as a unit."

From the record it is clear that the objectives of standardizing activities in Brazil are no different under ABNT sponsorship than they are in other countries. Good progress is being made by ABNT in the right direction and on a large variety of projects and activities. In the field of international cooperation, Brazil continues actively to participate by membership in, and close collaboration with, standardizing bodies such as the International Organization for Standardization, International Electrotechnical Commission, and others on communications, safety codes, nomenclature, and other problems.

Book Reviews

Refrigerating Data Book, Application Volume. Edited by D. C. McCoy. 3rd edition. (American Society of Refrigerating Engineers, 40 West 40th Street, New York 18, N. Y. $6.00)

Eighty-one authors, all recognized experts in their different fields, have reviewed, revised and brought up to date this second revision of Refrigerating Data Book, Application Volume. Several chapters have been completely rewritten to conform with the latest practice in refrigeration applications. In addition, the volume has been expanded to include five new chapters on subjects which have become of vital concern to the industry since 1946. These new chapters are: Packaging of Frozen Foods, Frozen Fruit Juice Concentrates, Storage of Dehydrated Fruits and Vegetables, Refrigeration of Fruits on Railroad Diners, and Metals for Use at Low Temperatures.

Extensive bibliographies are found throughout the book, providing sources of additional information for those interested in delving further into particular subjects. Eight major sections of this edition provide the latest information on the applications of refrigeration:—Frozen Foods, Cold Storage Practice, Refrigeration in Food Manufacture, Refrigerated Food Distribution, Low Temperature Applications, Industrial Applications, Comfort in Air Conditioning and Industrial Air Conditioning.

Heating, Ventilating and Air Conditioning Guide. 1951 Edition. (American Society of Heating and Ventilating Engineers, 51 Madison Avenue, New York 10. $7.50)

Completely revised, the new edition contains 50 chapters under the following headings: fundamentals, human reaction, heating and cooling loads, combustion and consumption of fuels, systems and equipment, special systems, instruments and codes.

Symbols for use on drawings of heating, cooling, and air conditioning system plans have been brought into conformity with the symbols recently adopted by the American Standards Association. The reference list of codes and standards has been enlarged to include 133 codes and standards of interest to the heating, ventilating, and air conditioning engineer. The latest editions of the codes are indicated and the names and addresses of organizations which can supply the various standards are given.

An elaborate cross index is included for the technical data section. The Guide also contains over 400 pages presenting products of prominent manufacturers who supply equipment for heating, ventilating, and air conditioning.

Thirty-four engineers contributed material within their special fields of interest for the revision of the new edition. They selected their material from recent research conducted at the ASHVE Research Laboratory, in Cleveland, and at other laboratories, as well as from current practice followed by engineers and associations.

Special features are the new ASHVE Psychrometric Chart, a simplified method of designing panel heating systems, and new data on determination of cooling load cost by heat gain through glass and glass block.

Revised, up-to-date heat loss co-efficients for doors, windows, and glass block are given in tables in the revised chapter on Heat Transmission Coefficients of Building Materials. In the chapter on Heating Load there have been added a method of estimating heat loss from floors on ground, and new factors for heat loss from basement floors and walls.

The sections pertaining to low height chimneys have been revised and clarified in the chapter on Chimneys and Draft Calculations.

Descriptions and suggestions for design of warm air ceiling panel systems and warm air perimeter systems have been added to the chapter on Forced Warm Air Systems. In the chapter on Hot Water Heating Systems, a new chart shows friction loss in copper tubing.

In the revision of the chapter on Air Duct Design, results of the latest ASHVE research have been used in preparing new data on duct elbow friction loss, and on effect of vanes and splitters in duct elbows. A large size reproduction of the ASHVE Friction Chart for Ducts is printed on the back of the ASHVE Psychrometric Chart.

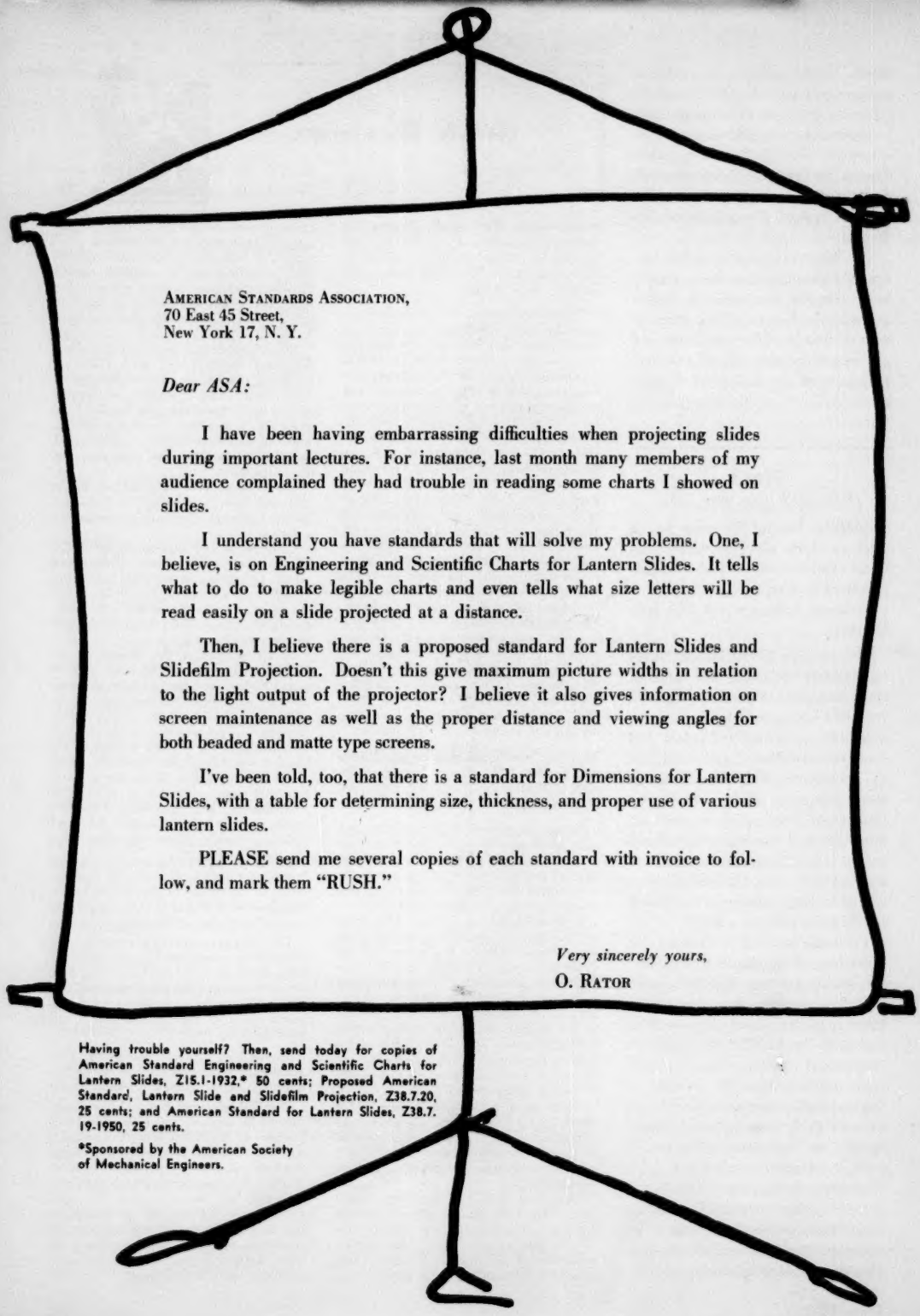
The latest practice of the fan industry has been used in bringing up to date the nomenclature and designations for fan drives, direction of rotation and discharge, and motor position, in the chapter on Fans.

Descriptive Color Names Dictionary. Supplement to Color Harmony Manual. By Helen D. Taylor and Lucille Knoche in collaboration with Walter C. Granville. (Container Corporation of America)

This 64-page dictionary contains 775 names so arranged that the user can work from names to colors, or conversely, from colors to names. The supplement includes all of the names commonly used to describe colors of merchandise sold in the mass markets.

National Fire Codes, Volume IV. (National Fire Protection Association, 60 Batterymarch Street, Boston 10, Mass, $4.00)

The 1951 edition of National Fire Codes, Volume IV replaces the 1946 edition and presents in convenient form, the complete and latest texts of 38 standards on Extinguishing and Alarm Equipment. Included in the volume are standards on automatic sprinklers and water supplies, fire extinguishers and fire hose, special extinguishing systems, municipal and rural public protection, fire alarm and supervisory systems, employee organization for fire safety and other miscellaneous tests.



AMERICAN STANDARDS ASSOCIATION,
70 East 45 Street,
New York 17, N. Y.

Dear ASA:

I have been having embarrassing difficulties when projecting slides during important lectures. For instance, last month many members of my audience complained they had trouble in reading some charts I showed on slides.

I understand you have standards that will solve my problems. One, I believe, is on Engineering and Scientific Charts for Lantern Slides. It tells what to do to make legible charts and even tells what size letters will be read easily on a slide projected at a distance.

Then, I believe there is a proposed standard for Lantern Slides and Slidefilm Projection. Doesn't this give maximum picture widths in relation to the light output of the projector? I believe it also gives information on screen maintenance as well as the proper distance and viewing angles for both beaded and matte type screens.

I've been told, too, that there is a standard for Dimensions for Lantern Slides, with a table for determining size, thickness, and proper use of various lantern slides.

PLEASE send me several copies of each standard with invoice to follow, and mark them "RUSH."

Very sincerely yours,
O. RATOR

Having trouble yourself? Then, send today for copies of American Standard Engineering and Scientific Charts for Lantern Slides, Z15.1-1932,* 50 cents; Proposed American Standard, Lantern Slide and Slidefilm Projection, Z38.7.20, 25 cents; and American Standard for Lantern Slides, Z38.7. 19-1950, 25 cents.

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